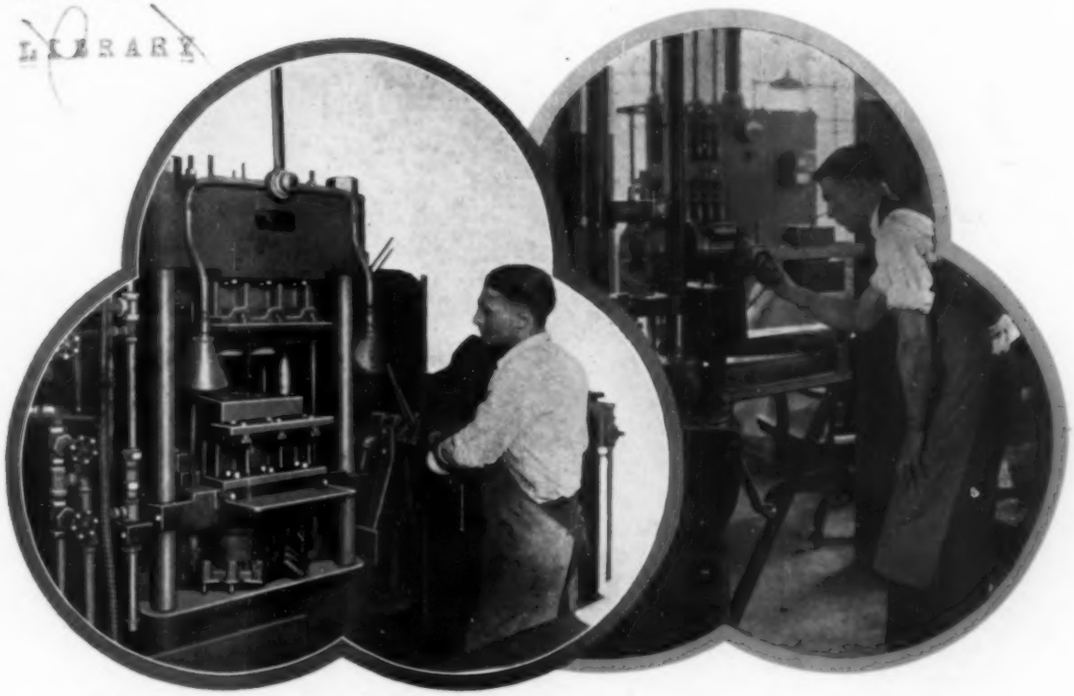
PLASTICS

A Periodical Devoted to the Manufacture and Use of Composition Products

BUREAU OF STANDARDS
NOV 22 1923
LIBRARY

JUNE, 1927



A field force of Engineers ready to serve you

Bakelite engineers with many years of practical experience are at your service to help in the solution of molding problems that you may encounter.

Through one of these Bakelite engineers you not only draw upon his own experiences, but also upon that of the whole field force, backed by the accumulate knowledge of the score or more chemists and engineers in Bakelite research laboratories. We welcome opportunities to cooperate with trade molders in overcoming difficulties, and in developing new business for them.

BAKELITE CORPORATION

247 Park Ave., New York, N. Y. Chicago Office, 635 W. 22nd St.

BAKELITE CORPORATION OF CANADA, LTD., 163 Dufferin St., Toronto, Can.

BAKELITE

REGISTERED U. S. PAT. OFF.

THE MATERIAL OF A THOUSAND USES

"The registered Trade Mark and Symbol shown above may be used only on products made from materials manufactured by Bakelite Corporation. Under the capital 'B' is the numerical sign for infinity, or unlimited quantity. It symbolizes the infinite number of present and future uses of Bakelite Corporation's products."

Molded Products

See Page 291

KAROLITH

"The All-American Casein Plastic"

The first cost of Karolith is unusually low. It is so workable, production costs are brought down to an astonishing minimum.

Just check these advantages—and then apply them to your particular requirements:

1. **Tasteless**
2. **Odorless**
3. **Non-Inflammable**
4. **Machines Perfectly**
5. **Cannot Fade**
6. **Comes in Rods, Sheets, Tubes, in All Plain Colors and Mottled Effects**
7. **Impervious to Alcohol**
8. **Transparent—Ideal for Sign Making**

Karolith Is a Non-Conductor of Heat and Electricity---Approved by the National Board of Fire Underwriters

KAROLITH

Samples, Specifications and Prices Sent Upon Request

KAROLITH CORPORATION

189-207 Thirteenth St., Long Island City, N. Y.

PLASTICS, Vol. III, No. 6, June 1927. Publication office 49 E. Washington Avenue, Washington, N. J. Executive office, 471 Fourth Ave., New York City, N. Y., by The Hoffman Publications, Inc., Sylvan Hoffman, President. Subscription price, Domestic $3.00 per year, 35c per copy. Foreign and Canada, $4.00 per year. Entered as second-class mail at the Post Office at Washington, N. J., under the Act of March, 1879, and copyright, 1927, by The Hoffman Publications, Inc.

DUREZ for the harder service
DUREZ for the thinner, lighter part

DUREZ is a plastic that can be used with confidence to mold parts that must meet requirements of exceptional strength and durability. Durez parts have extraordinary resistance to wear, heat, shock and strain. They come from the mold complete, ready for a long life of useful service even under severe conditions.

Durez frequently reduces manufacturing costs when used to replace wood, ivory, hard rubber, glass or metals—materials that must be machined, worked or finished before assembly.

Durez takes the form of the mold with extreme accuracy and its mechanical strength makes very thin sections practical. Strong and quick-hardening, it saves the cost of careful, time-consuming labor that is required when delicate parts are made of other materials.

All the qualities of Durez—its high physical and dielectric strength, its attractive permanent luster, its accurate molding and quick-hardening, its ready adaptability—have gained preference for it in many industries. The most advantageous application of this plastic to your production process will be determined in the Durez laboratory, without obligation.

Molded samples of Durez and complete data sent on request. Specify color and use.

GENERAL PLASTICS
INCORPORATED
NORTH TONAWANDA, NEW YORK
CHICAGO NEW YORK SAN FRANCISCO

DUREZ

SYNTHETIC
CAMPHOR
(SCHERING)

C. B. PETERS CO., INC.
110 WILLIAM STREET NEW YORK
CABLE ADDRESS "PERSVAR" TELEPHONE BEEKMAN 0880

WOOD FLOUR

Manufactured by

John C. Hoornbeek Sons Napanoch, N. Y.

Inquiries Solicited

Tubes

and Fountain Pens

Inda
(non-inflammable)

THERE is a decided advantage to the manufacturer of fountain pens and magazine pencils in the use of Inda tubes. The interiors of the tubes do not have to be drilled out.

Consequently a substantial part of the material bought is not wasted—as with rods—and the work of manufacturers is correspondingly decreased.

Inda, the perfected, non-inflammable casein solid, may be had in all solid colors, and in beautiful metallic and non-metallic mottles, in tubes of varying sizes and wall thicknesses as well as in rod and sheet form.

Inquiries are respectfully solicited.

American Machine & Foundry Co.
5502-5524 Second Avenue
Brooklyn, N. Y.

Aladdinite

1St

in United States

Aladdinite was the first casein plastic to be manufactured in this country.

In Aladdinite you have a strong, durable, workable material that is **INEXPENSIVE, NON-INFLAMMABLE** and **SANITARY.**

It machines easily because it is made from the finest quality of imported casein.

The uses of Aladdinite are unlimited, particularly being applied in the button industry, in radio, for novelties, fountain pens, pencils, cigarette holders, beads and combs.

Aladdinite is superior to hard rubber, wood, ivory, or any expensive and dangerous materials for both economic and safety reasons.

Aladdinite comes in sheets and rods—in all colors, either solid or mottled, and such pretty effects as buffalo horn and tortoise shell. It takes a beautiful finish readily.

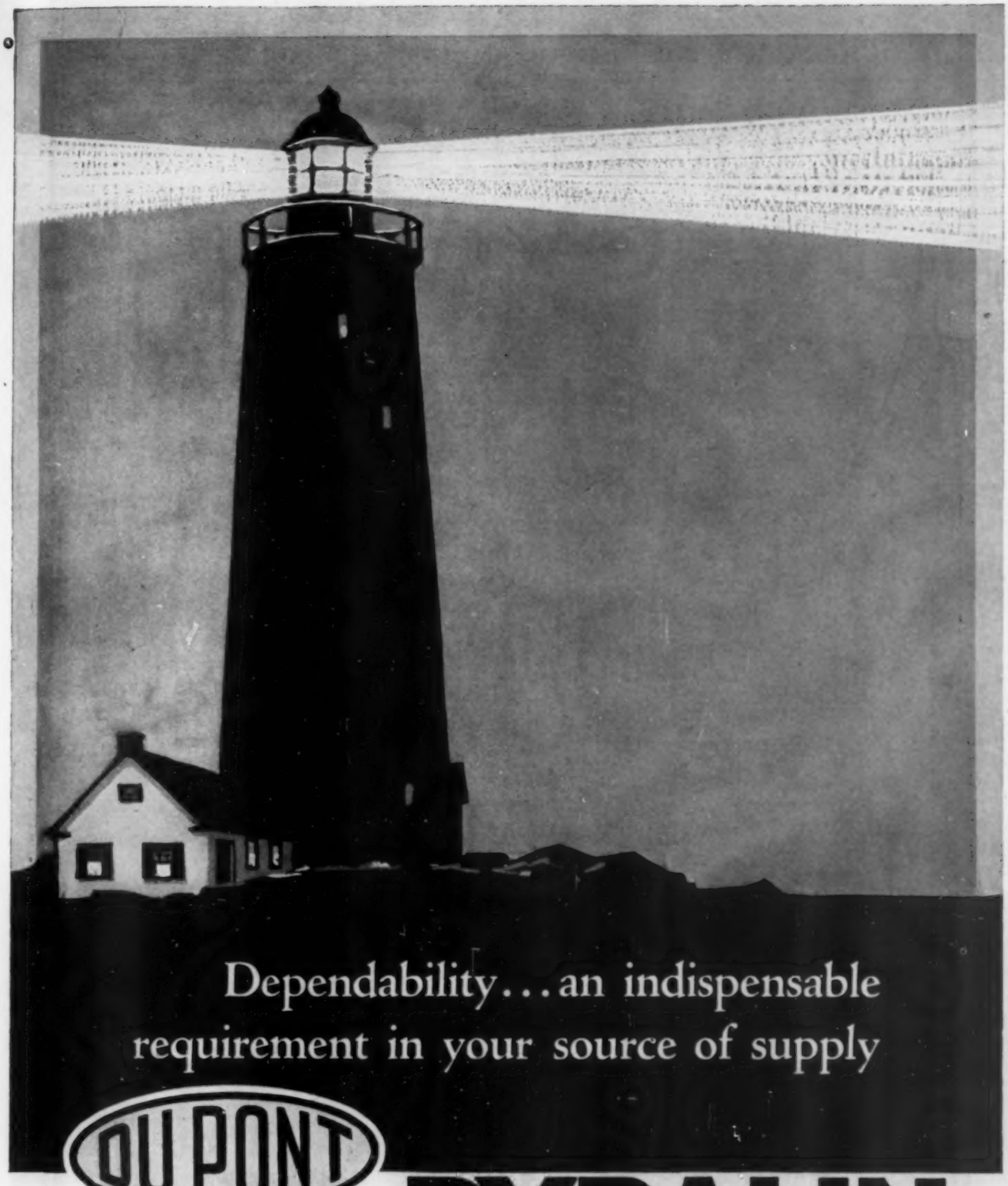
If you are interested in component parts made from Aladdinite, we shall gladly refer you to reputable manufacturers fabricating it.

Insist on Aladdinite, the original American material.

Aladdinite Co., Inc.

ORANGE, N. J.

Established 1919



Dependability... an indispensable requirement in your source of supply

DU PONT

PYRALIN

SHEETS RODS TUBES

Plants at ARLINGTON, N. J. and LEOMINSTER, MASS.

Two large plants... careful chemical control of manufacture... and a sound production policy... these are some of the things that contribute to the dependability of Pyralin.

What next will be made of Pyralin?

Du Pont Viscoloid Company, 330 Fifth Avenue, New York City

BURROUGHS BURROUGHS BURROUGHS

BURROUGHS

A NAME of authority in methods and equipment for working Thermo Plastic Materials.

IF YOU want to mold composition articles why not avail yourself of our experience and facilities rather than resort to makers of fractional parts of the equipment when we can supply them all.

You would not think of buying a coat, vest and trousers for a suit from different makers or dealers.

Why then buy an unbalanced outfit of machinery and molds impossible of coordination for your production requirements ?

The Burroughs Company

Established 1869

248 NORTH TENTH STREET NEWARK, N. J.

BUILDERS OF HYDRAULIC MACHINERY FOR ALL PURPOSES

BURROUGHS BURROUGHS BURROUGHS

"ONCE a customer, always a customer." This axiom was one a famous merchant was very fond of applying to his business. *Plastics* can also use this in relation to its advertising clientele.

On looking at the first few issues of the magazine, and then at this one, it is amazing to find that practically every advertiser who took the opportunity to reach this new market through the early pages of *Plastics* is still using it as his medium.

No better tribute, no more authentic recommendation of a publication, could be given than this continued patronage of our customer-advertisers.

* * *

Plastics has always kept a large reserve stock of each number. This reserve has been exhausted in the case of several issues. We have often been obliged to lend our office copies to people wanting information covered by articles in those issues. These loans have been made in many instances to men who then seemed to have no connection with the plastics industry. This is an important fact. These men (outside our immediate field) were informed about articles in *Plastics* and insisted upon reading them. Person to person advertising, the most valuable kind.

* * *

Reader interest creates advertising worth. Our early readers as well as our early advertisers have become wedded to *Plastics*. Every mail brings new readers, men who have been told of *Plastics* by others and the same mail brings inquiries from firms who want to reach our readers.

An endless chain continually adding new links.

The Publishers.

PLASTICS
& MOLDED PRODUCTS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 3 June, 1927 No. 6

Contents

Molded Insulating Materials in the Electrical Industries By Dr. Ing. Sommerfeld - - - 263
Requirements of modern practice and recent steps toward standardization.

Safety Services of Pyroxylin - - - - - - - 264
Some new aids for the car owner.

Increased Demands for "Zyl" Frames Lead to New Methods for Rapid Production, By Carl Marx - 265

The Manufacture of Casein Solids, By H. Prehn - 267
V. Pressing and polishing plates of uniform thickness described in detail.

Converting Chitin into the Plastic State, By Prof. P. P. von Weiman - - - 269
Concentrated aqueous solutions of certain salts dispergate materials from the shells of crustaceans so that they can be drawn into filaments and otherwise formed.

Rise of the Button Industry, By Dipl. Ing. Fr. P. Pondorf 270
The first buttons were made of horn, bone and mother-of-pearl, but the synthetics have replaced most of the natural materials in this field.

The Use of Asbestos in Plastics, By H. Rosenberg - 274
The particular grade sometimes known as Micro-asbestos is especially useful as an inert and heat-resistant filler.

Editorial Impressions - - - - - - - - 276
Just a word of explanation.
And now success.

Technical Abstracts - - - - - - - - 278

Activities in the Industry - - - - - - - 290

MOLDED PRODUCTS

The Age of Molding, By A. Moses - - - - - 291
11 Further instances of the successful replacement of metal.

A Different Loud Speaker - - - - - - - 292

Shall We Mold Our Own? By A. E. Buttner - - - 293

Emblem Switch Plates—A New Departure - - - 294

Soda Fountain Developments - - - - - - 294

Distinguishing Molded Parts, By W. F. Lent - - 296
Simple tests presented in a form useful and handy for reference.

Fitting Hinges - - - - - - - - - 298

Starite—a Versatile Plastic - - - - - - - 299

Looking Back, By V. C. Rockhill - - - - 300

Another Bakelite Promotion Display - - - - 303

In Germany - - - - - - - - - - 304

Automobile Door Handles - - - - - - - 305

Carl Marx, B. Ch., Editor
A. Moses, B. Sc., A. I. C., Associate Editor
William Grünstein, E. E., A. M., Associate Editor
V. C. Rockhill, Consulting Editor
A. C. Blackall, British Correspondent
Heinrich Prehn, German Correspondent

Publication Office: Washington, N. J.

Offices: 471 4th Ave., New York. Telephones: Ashland 6280, 6281
SYLVAN HOFFMAN, Publisher ALAN COHEN, Adv. Director
E. D. Sheriffs, Chicago Representative
80 E. Jackson Blvd.

Issued Monthly
35 cents a copy

Subscription Price
U. S. $3.00, Foreign $4.00 Per Year

Copyright, 1927

Articles made of

Erinoid

The Dependable
Casein Solid

All colors, in sheets, rods and tubes

ERINOID COMPANY OF AMERICA
15 PARK ROW NEW YORK CITY

Factory: Bainbridge, New York

PLASTICS

A periodical devoted to the manufacture
and use of plastic and composition products

Vol. 3 JUNE, 1927 No. 6

Molded Insulating Materials in the Electrical Industries

Requirements of modern practice and recent steps toward standardization

By Dr. Ing. *Sommerfeld*

Molded electrical insulation is made from plastic materials, being formed by pressing, usually under very high pressure. The present article will exclude from consideration all insulating materials made from paper, rubber or caoutchouc, and of ceramic ware, and will confine itself only to such molded products as are fabricated from rubber-free insulating materials.

Formerly, in the electrotechnical industries, porcelain and hard rubber were practically the only insulating materials employed, and but little was known regarding the plastics. Any manufacturers who were at that time using plastics did so very secretively, and tried in every way they could to hide the fact that they were using any but the orthodox substances.

The First Departure

The first efforts to produce insulating materials other than rubber were caused by the desire to find some substitute for rubber, as the latter was very expensive. Shellac was one of the first materials called upon, and some very excellent results were obtained with it, but attempts to use still more inexpensive substances were continually being made. Almost every conceivable material was tried out at one time or another for the preparation of molded insulation. For example, plastics have been described as having been produced from peat, seatang, yeast, horn, glue, starch, dextrin, etc. All attempts to make a really serviceable electrical insulating material from such substances failed for one reason or another, and mainly because these materials did not fulfill two of the absolute essentials for a serviceable electrical insulation, namely: resistance to the influence of moisture, and resistance against heat. Furthermore there were no definite specifications in the early days, and it was not until such specifications were worked out (as for example those promulgated by the Verband Deutscher Elektrotechniker) that definite progress was made.

The most important event in the field of modern molded electrical insulation was the advent of the synthetic resins, and especially of Bakelite. Only from that point on did the "substitutes" become independently useful materials, that required no apologies, and that exhibited the necessary stability in the presence of moisture and of heat.

Standard Specifications

The German "Verein Deutscher Elektrotechniker" then worked out standard specifications for molded electrical insulation, and is at present actively engaged in doing the same for other modern insulating materials, such as fibrous materials, laminated products, lacquers and impregnating fluids, insulating oils, resins, wood, vulcanized fiber, and similar products. Furthermore, a committee of the German Zen-

At a meeting of the Elektrotechnischer Verein, at Berlin, Germany, April 26, 1927, Dr. Ing. Sommerfeld read a paper on Molded Insulating Materials employed in the electrical industries. As the material in this paper is of importance in the general field of Plastics, we are pleased to present this contribution to the art of electrical insulation to our readers, having obtained the publishing rights for this article in the United States. Because of its length, it will be necessary to print the article in a number of issues of PLASTICS.

tralverband (Union) of the Elektrotechnical Industries has effected a classification of the various insulating materials. Recently there has also been organized an Association of Manufacturers of Rubber-free Insulating Materials, which is now negotiating with the (German) Official Government Testing Bureaus for standardization in the entire field of testing and use of electrical insulation. Methods are now being developed for testing such products not only for heat resistance and the effects of moisture, but also for a considerable number of other essential properties. Moreover, a definite, scientific classification of electrical insulating materials is also being worked out.

Fundamentals

Most of the molded insulating materials consist of an agglomerating or binding agent, fibrous substances, and fillers. The binders usually comprise natural and artificial asphalts, and natural as well as artificial and synthetic resins. Shellac has lost some of its importance, and the employment of drying oil (such as tung oil) has also declined somewhat. (That is to say, in European practice. Ed.).

The fibrous substances are added for the purpose of overcoming the brittleness of the fillers. The fibers most widely used are asbestos, then cellulose, and finally cotton waste (flock, etc.) and wood shavings. These fillers serve not merely to load the insulation, but also to give it the necessary hardness. The fillers should be chemically inert, resistant to heat, and cheap and readily obtainable. Some of the more common filling materials are heavy spar (barytes, barium sulfate), marble dust and other pulverized minerals. During the mixing of the various ingredients, and especially during the molding and curing operation, chemical reactions, such as polymerization, condensation and combination take place.

As a general rule, the articles to be employed for electrical insulating purposes are pressed under high hydraulic pressure, usually of the order of over 500 kilograms per square centimeter, as the valuable properties of the finished material depend to a great degree upon the uniformity and density of the molded objects.

While in many instances the molding operation is carried out hot, there are also processes in which solvents are used to provide a binder that will permit of molding cold, the solvent being afterwards eliminated by either evaporation or by chemical reactions in the mass, usually initiated by heating or baking.

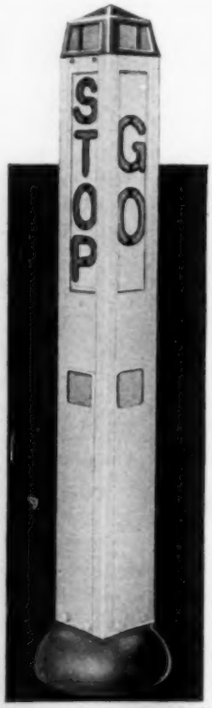
Whereas other industries are able to work with raw materials, as for example metals, of definite and well-defined properties, the manufacturers of molded insulation in most cases work with their own favorite mixtures. The difficulties encountered, especially the testing of the raw materials, are very considerable, as no methods have as yet been evolved for the independent testing of the binders, the fibrous materials or the fillers, as their properties appear to be vitally affected by the presence of one ingredient with the other. For example it is impossible to test the binders by themselves as they are very brittle unless mixed with the other substances; and likewise the fibers alone usually have but little insulating value.

The final properties developed by a given insulating material depend very largely upon the heat-treatment during molding, the after-treatment, pressure employed and other somewhat imponderable influences.

The classification of the various insulating materials, their properties, defects and relative advantages will be taken up in the July issue of PLASTICS, *where this interesting paper by Dr. Sommerfeld will be continued.*

Safety Services of Pyroxylin

Some New Aids for the Car Owner



"American Bobby" uses pyroxylin sheets for colored signs.

THE glare when his rear-view mirror reflects the stray beams from a car following his own, is frequently such as to add considerably to the strain of driving at night. To lessen this strain, the "Kilglare" has recently made its début a device molded from green Pyralin, a pyroxylin plastic, capable of being clamped to the mirror and raised or lowered at will. As

How the Kilglare is clamped to the mirror. In daytime, it may be raised to allow the usual reflection

Illustrations by courtesy of the Du Pont Magazine.

the device permits the driver to see the roadway behind him, there is no necessity to pull down the rear curtain in a closed car, a practice already declared unlawful in many states. The N. A. Petry Co., 328 North Randolph St., Philadelphia, Pa., are the manufacturers.

Other aids to nocturnal driving are the "Glare Checks" for windshields and headlights made

(*Continued on page 282*)

Increased Demand for "Zyl" Frames Leads to New Methods for Rapid Production

Some recent patents propose radical changes in the processes of manufacture used heretofore

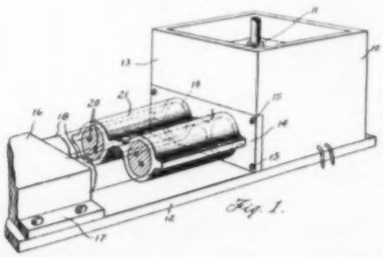
By Carl Marx

EVER since the Chinese invented the forerunners of our modern eye-glasses, shell-rims have been one of the mainstays of the spectacle industry, and ages before the modern Zylonite or "Zyl" (pyroxylin) frame was invented the humble tortoise was called upon to produce the necessary shell for framing the lenses.

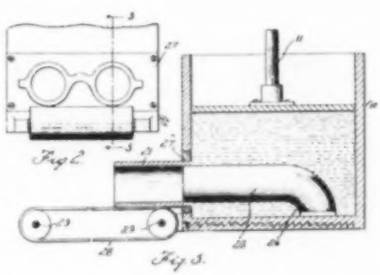
With the advent of the pyroxylin plastics, a much more satisfactory material was made available, for it is a fact that despite common opinion, the synthetic horn, or Zyl spectacle frame is in every way vastly superior to that made from genuine tortoise shell.

Why Zyl?

In the first place, real tortoise shell, although a very beautiful material, lacks plasticity, and is very brittle. Furthermore it is very easy to break, and almost impossible to mend properly, and when it is considered that each pair of eye-glasses must be carefully adjusted to the face and nose of the wearer, which means bending and shaping the many advantages of a zyl frame become manifest. This material, by simply heating over a hot-plate, becomes sufficiently soft and plastic to allow of shaping to form. Also, the insertion and removal of the lenses is readily



The entire tubular portion is extruded, individual blanks are then sliced off.



The extruded tubes are carried forward on a belt.

accomplished; and the size of the lens-frame can be slightly enlarged when it becomes necessary.

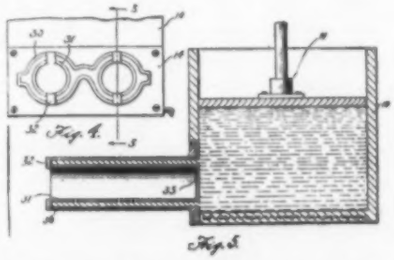
With all these advantages, it is quite evident that the production of Zyl frames soon became a large industry, and the optical trade is a very large consumer of the better grades of pyroxylin plastic materials. Much as a universal name for the pyroxylin plastics might be desired, in no industry except that of the optical frames has such a name become standardized, and among the users of pyroxylin frames, the word "Zyl" is used for any grade of this material. The origin of this word is simple. It is nothing more nor less than a contraction of the original "Zylonite" introduced into this country concomitantly with the rise of Hyatt's Celluloid by Daniel Spill, ably assisted by Dr. Robert Schuepphaus, that indefatigable plastics' pioneer, who, we are glad to say, is still among us.

It would be a good plan to adopt this word "Zyl" in referring to all the pyroxylin plastics generally, as it is significant, easy to pronounce, and distinctly historical.

The production of zyl lens-holders has been based mainly upon the cutting up of sheets, with the resultant loss of about 50% of the material, as the centers of the lens-spaces, and trimmings from the bridge and temple parts could not be used for anything except for sale as scrap. Within the past few years much progress has been made, and *Plastics* has reviewed quite a number of patents on improved mechanical methods of extruding rods and curved pieces, tubes, etc., which lent themselves to the more economical manufacture of spectacle frames. (See Plastics 1926, pp. 99, 134, 206, 367, 403, 452, 454; 1927, p. 62.)

Extruding a Tube From Which Blanks Are Cut

One of the most advanced methods thus far proposed, however, is one that has been patented to Frank Frazer and assigned to the American Optical Co. of Southbridge, Mass., (U. S. P. 1,607,522, Nov. 16, 1926). This is nothing less than the extrusion of a hollow member of zyl composition in such a form that the blanks for the spectacle frames can be cut from the same by a simple slicing operation without any waste of material. This is a distinct step in advance and should prove instrumental in lowering the cost of production, and incidentally also the cost to the



A diagramatic sectional view of the apparatus used.

consumer, of all-zyl frames.

To give our readers a general idea of how this new process is carried out, we have illustrated the method with some of the drawings that accompany the patent in question, and have reproduced such parts of the specification as are necessary for a thorough understanding of the same.

In the drawings, wherein like numerals are employed to designate like parts throughout the same:

Figure 1 is a perspective view illustrating one form of machine used.

Figure 2 is a front view of a slight modification thereof.

Figure 3 is a longitudinal section taken on line 3—3 of Figure 2 and looking in the direction of the arrow.

Figure 4 is an end view of another modification of the invention.

Figure 5 is a longitudinal section taken on line 5—5 of Figure 4.

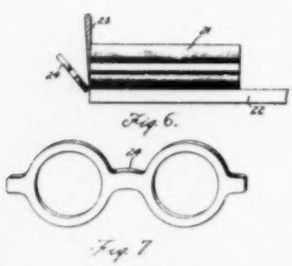


Fig. 6.

Fig. 7

Figure 6 illustrates a step in the process of cutting off the individual blanks from the elongated blanks.

Figure 7 is a perspective view of the ophthalmic blank cut from the elongated blank or sleeve.

In the drawings the numeral 10 designates a suitable receptacle in which a plunger 11 is shown, by which means pressure is brought to bear upon the composition within the container 10, but it is to be understood that any form of pressure may be used with equal results.

In Figure 1 of the drawings the receptacle 10 is shown as being mounted upon an elongated base 12 extending for a considerable distance beyond the front face 13 of the container. A removable plate 14 which is held in place by screws or the like 15 is situated at the lower portion of the front face of the container 10, as is clearly illustrated. The removable plate 14 has formed therein an opening assuming the general configuration of an ophthalmic blank such as is desired in the finished product.

Mounted at the opposite end of the base 12 is a block 16 slidable between the raceways 17 so as to allow of its removal when desired. Of course, a pivoted stop may be mounted at its outer end to prevent displacement when it is desired to maintain the block 16 in a rigid position. Extending longitudinally from the block 16 are two cylindrical cores 18 which are mounted in spaced parallel relation and are adapted to extend within the opening 19 formed in the removable plate 14, as is clearly shown in Figure 1.

Extruding

The block 16 may be positioned on the guide at the desired distance from the container 10, the cores 18 extending up to the container. After the plastic composition in the container is forced over the cores the composition is allowed to cool and set. The said portion is then cut off close to the face 13 of the container. While the extruded portion is cooling the pressure in the container is removed. After the extruded portion has been cut off the block 16 is moved away from the container on the base 12 and the cut off portion removed. The cores 18 are then pushed back with the block 16 to engage the opening in the container for a second extrusion. It is, of course, understood that the plastic composition in the container is of such a consistency that without pressure being applied it will not flow through the opening in the container.

Heated Cores Used

When pressure is applied to the heated contents of the container 10 the composition is extruded or forced through the opening 19 upon the cores 18, which may be heated as by the electrical means 20, if desired, whereupon the cores 18 and block 16 may be removed when a sufficient length of material 21 has been forced thereon and allowed to cool. It is to be noticed that the opening 19 is restricted when the cores 18 are in place so as to assume the proper shape; that is, the two rings connected by a central web or nose portion, and has the two ribs formed at their outer extremities. When the sleeve or elongated blank 21 has sufficiently cooled or partially seasoned, as desired, it may be removed from the cores 18 and placed upon a block 22 and the desired thickness of blank may be cut off by means of a sharp instrument such as a knife or saw 23, thus forming an excellent ophthalmic blank 24. It is to be understood that this blank 24 may be of any size or shape, which shape is determined by the shape and size of the opening 19 formed in the container. It will thus be seen that various plates 14 having various sized openings may be placed in position and the material extruded therethrough so as to form an elongated blank or sleeve, wherupon after sufficient cooling the sleeve is cut up into blanks without having necessitated the usual waste of material, as has heretofore been experienced.

Forming the Core

In Figures 2 and 3 of the drawings a slight modification is shown wherein the same container 10 and plunger 11 are provided. Located within the container 10 is a core 25 which is bolted to the bottom of the container by means of the bolts 26, which shall be of sufficient strength to maintain the core 25 in a rigid position. The core 25 is slightly curved at one end, but is provided with a long longitudinally extending portion as shown so that the outer end will fit within an opening similar to the opening 19 in Figure 1 of the plate 27. It is to be understood that the core 25 does not extend beyond the outer face of the plate 27 so that the composition which has been extruded by means of the pressure

(*Continued on page 283*)

The Manufacture of Casein Solids

V. Pressing and polishing of plates of uniform thickness described in detail

By Heinrich Prehn
Consulting Engineer, German Correspondent of Plastics

This is a further continuation of a series of authoritative articles that for the first time disclose the details of the manufacture of casein solids. The series began in the January issue and will be continued monthly.

THE general working principles of the hydraulic press equipment will be only lightly touched upon. As we have already learned, the actuating medium of the hydraulic presses is water. It is true that certain types of presses are actuated by means of steam, and some even by compressed air, but water remains as the best pressure-applying medium.

The great advantage of hydraulic machinery lies in the fundamental principle of hydrostatics. Pressure applied to a practically non-compressible fluid medium such as a liquid, (water, for example), is transmitted equally in every direction, and the means are thereby provided for multiplying the pressure many times by enlarging the movable portion of a closed pressure chamber. A pressure pump forces water into the cylinder which carries the plunger, and the pressure is multiplied in the same ratio as the surface of the pressure plunger is larger than that of the pump-plunger. Some hydraulic presses, for example, apply thousands of pounds pressure for every square inch of the pressure plunger. In other words, a relatively small pump-plunger, by driving water into a larger chamber and corresponding larger press-plunger can actuate a large hydraulic press.

Closing the Press

The plunger, which is moved either directly by the water forced into the same from the hydraulic pump, or through an intervening hydraulic accumulator gradually closes the superimposed individual stages or platens of the hydraulic press. After the low-pressure pump has closed the press, the high-pressure water is applied fully to compress the sheets of casein solids which have been placed between the platen of the press. The pressure usually is allowed to act for some time, and is transmitted to the plastic material uniformly. The press is then opened. This operation also is relatively slow.

From the preceding description it will be evident that hydraulic presses are not suitable for making a large number of very rapid individual pressings, but are rather intended for high pressure of considerable duration. Pressures can be obtained by means of hydraulic presses that can not be equalled by any other type of mechanism.

Increasing Production

The yield per given press can be increased by multiplying the number of stages or platens, but even here there are practical commercial limits, as if there are too many stages the space between the platens is too limited, and furthermore if the material is used too thin, non-uniform plates or sheets of casein solids will result.

The production can, however, be increased by the logical routing and handling of the material. During the time the press is under pressure, the next set of frames and platens can be filled with raw material, so that the individual stages of the multi-stage press can be charged as soon as the pressed stock is removed after a pressing. Moreover, the use of individual hot and cold presses, as already pointed out earlier (May,1927) also increases the possible daily production per press. Using all these advantages, from 3 to 4 pressings can be carried out each hour, the larger number referring to somewhat thinner plates.

The temperature of the press plates, for a multi-stage press working with casein solids, varies between 65 and 90° C. The temperature must be accurately controlled, and in cases of delicate shades and tints should be lower than with solid colors, in order to prevent injury to the color. A more accurate control of the temperature is possible when hot water is used for heating the press-plates than when steam is employed.

Placing the Rods

The positioning and size of the rods to be placed in the frames of the hydraulic presses for making casein solids sheets have already been discussed in detail in April issue of *Plastics*. The various defects that might develop from improper charging have also been taken up. It should be considered, at this point, that the welding of the rods into a plate or sheet must result from only a short travel of the plates of the press, but the pressure must be applied until no excess of material exudes any longer from the press, and that the pressure must be applied long enough to insure a thoroughly homogeneous plate or sheet. If this is not done, the material will be uneven and not satisfactory.

A few points and details of interest should be mentioned. For accurate and ready control of heating water, steam or cooling

water, or for the removal of condensed steam from the channels of the press-plates, drain-cocks should be located at the lower end of the distributor head. Some manufacturers omit these, but the purchaser should insist upon them, as they will prove to be considerable time and trouble savers. If the press, however, is used purely as a cold press, or merely as a hot press, this precaution may be omitted. When hot water is used for heating the plates of the press, this water is allowed to circulate, and is reheated in a suitable boiler. The piping should be so arranged that individual presses of a system may be thrown in and out of service, as may be desirable. When a press is employed both in the capacity of a hot as well as a cooling press, sufficient steam must always be available to drive out the water that has condensed and accumulated in the heating-channels in the heated platens. For this reason the air-vent must be opened before steam is admitted.

Possible Difficulties

It is not possible to give definite directions regarding the amount or weight of material required for forming individual plates, as this will naturally vary considerably with the amount of water, fillers, chemicals and other ingredients present in the casein solids mixture. Furthermore, the size of plates made by various producers varies somewhat, although a size of 500 x 400 millimeters has become fairly standardized. In order to get a finished plate of this dimension, the size at the start should be about 10 per cent greater. Figuring on plates from 2 to 5 millimeters thick, and of the size just mentioned, there will be required from 500 to 1300 grams (1.10 lbs to 2.75 lbs.) of raw material, with the corresponding amounts for dimensions intermediate to those stated.

A common fault developed when pressing casein solids rods into plates is "empty corners." This may be caused by improper positioning of the rods in the press, an insufficient amount of material, or by a sliding of the material when the press is being closed; the latter being caused by the plates of the press not being strictly in parallel alinement. Such defective plates should never be placed in the hardening bath, but should either be cut down to a smaller size, or pressed over again until they are right.

If the plates should not leave the forms readily, they can be loosened by means of a knife, but the manipulation must be carried out gingerly, as a reckless tearing out of the pressed plates must be avoided under all circumstances. The plates are then marked with a wax pencil as to color, thickness and date, and other identifying marks and are then laid upon a flat table, and covered with damp cloths to avoid as far as possible the deleterious action of the air. When sufficient plates have thus accumulated to fill a rack, usually drawn up to the table on a truck, the rack is filled, the plates having first been weighed and counted. The plates and rack are then transported to, and immersed in the hardening bath.

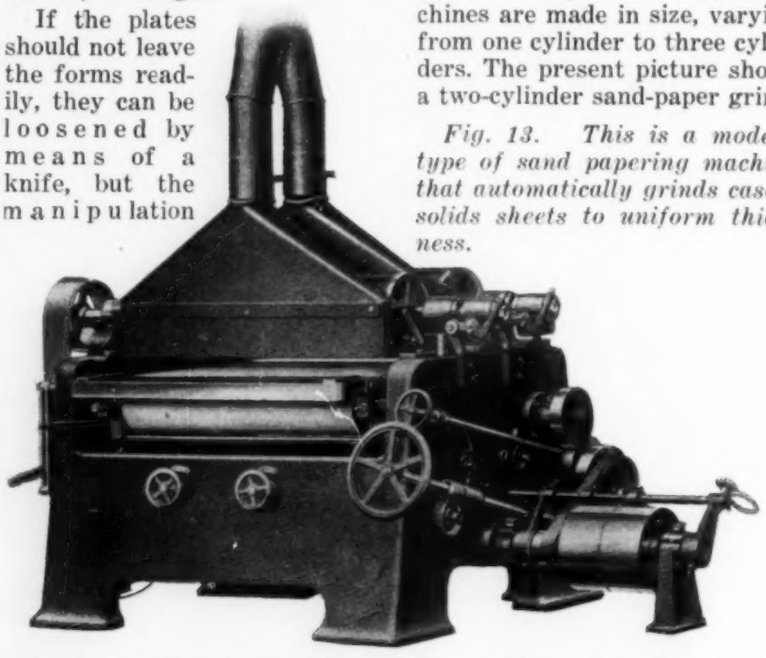


Fig. 13. This is a modern type of sand papering machine that automatically grinds casein solids sheets to uniform thickness.

Grinding the Plates

The plates made upon multi-platen hydraulic presses usually have one defect—namely, they are not uniform in thickness. Differences as great at 0.2 mm. can be noticed at different spots on the plate, and it is almost impossible to avoid this. These differences usually become worse as the pressing equipment gets older and shows signs of wear and tear. All kinds of remedies have been proposed, as perfectly uniform plates are very much desired by the trade.

In order to meet the demand for such plates, sand-papering machines, or grinders, have been constructed. These are illustrated in Figure 13. The machines are made in size, varying from one cylinder to three cylinders. The present picture shows a two-cylinder sand-paper grinding-machine, the view being from the driving side. These machines have given excellent satisfaction for the purpose and are to be found in many casein solids plants.

Some of the constructional details of these plate grinding machines require mention. The supporting platen or table is not strictly rigid, but is held under adjustable spring pressure. The pressure can be regulated both for the feed as well as the discharge side. The amount of material to be removed by sand-papering, or in other words the thickness of the plates, is regulated by adjustment of the first driving cylinder. The first and second grinding cylinders are also easily regulated as to the amount of material to be taken off the plates. The adjustment is made from the right-hand side of the machine, by means of the levers shown. The height

(*Continued on page 281*)

Converting Chitin Into the Plastic State

Concentrated aqueous solutions of certain salts dispergate materials from shells of crustaceans so that they can be drawn into filaments and otherwise formed

By Prof. P. P. von Weimarn

From Revue Generale des Products Chimiques, 1926, 2, 743-751

AS far back as 1912, the writer of these lines had established (2) the fact, that aqueous solutions of any readily soluble salts, capable of strong hydration, possess the ability to convert cellulose into the plastic state, as well as being able to produce the colloidal dissolution of cellulose.

The concentration of the solution, the temperature at which the dispersal of cellulose proceeds, also the time interval necessary to complete the dispersal process vary, of course, in accordance with the nature of the salt taken, its insolubility, and its relative degree of hydration.

Theoretical Considerations

If by the ability of salts to produce dispersal (designated by the symbol D), we understand the magnitudes directly dependent on the average rates of dispersal of the same kind of cellulose (the other conditions of work being, of course, equal), then the following series of inequalities (3) would be both theoretically and experimentally established e. g. for certain lithium and calcium salts.

$$D_{LiCNS} > D_{LiI} > D_{LiBr}$$

$$D_{Ca(CNS)_2} > D_{CaI_2} > D_{CaBr_2}$$

These six salts give examples of salts with high dispersal abilities.

In 1913, the author announced definitely that, in theory, aqueous salt solutions are able to disperse not only cellulose, but also other dispersoids capable of hydrolysis into soluble products:

" *The above theory may be generalized for any dispersoid which yields soluble compounds through hydrolysis.* " (4).

The discoveries of Professor Weimarn and his co-worker, S. Utzino, made in Japan, lead to some very interesting possibilities for the production of new types of plastic materials. This article appeared in both French and English in our French contemporary, and has also been reproduced in Industrial and Engineering Chemistry recently. Its importance in this field fully warrants its reproduction in our pages, and further developments along this line will be followed with great interest.

In other words, such organic colloids, as fibroin (chief constituent of natural silk), chitin, (containing nitrogen polysaccharide i. e. the nearest analogue to cellulose), the chief constituent part of the shells of cuttlefish (sepia), crayfish, crabs, lobsters, beetles, etc., and similar colloids, are also convertible by means of concentrated aqueous salt solutions into the ropy-plastic state and into colloidal solutions.

The experimental proof of this theoretical deduction could be realized by the author only in the middle of December 1925, with fibroin, and in collaboration with S. Utzino (5) at the beginning of the year 1926 (February-March), with chitin, casein, fibrin and keratin.

Experiments With Fibroin

Fibroin (silk wadding being used for experimenting), proved to possess a considerably higher ability to colloidal dispergability in aqueous salt solutions than that of cellulose; for instance, LiCNS solutions produce colloidal dissolution of silk wadding at room temperatures (e. g. at 25°C.) and—what is of special practical importance—10 gr. e. g. of silk wadding may be dissolved in 5-10 minutes in 100 cc. of neutral aqueous solutions of such common and cheap salts as $CaCl_2$ or $Ca(NO_3)_2$ at their boiling temperatures, 115° C.

The preparation of 30% colloidal solutions of silk in the solutions of these salts is quite realisable.

Fibroin may be separated from these colloidal solutions in a perfect ropy-plastic state by means of various dehydrating and coagulating substances and agents (also by ultrafiltration and centrifuging).

Of utmost interest is the formation of a filiform coagulum obtained by means of ethylic alcohol.

For example, to 10% colloidal solution of fibroin in $Ca(NO_3)_2$ aqueous solution, cooled from 115° to 50°-25° C same quantity of ethyl alcohol of ordinary temperature is added, while constantly stirring the contents with a glass rod; a filamentous precipitate of fibroin is formed, which will wind round the glass rod like a reel.

The ropy-plasticity of this precipitate permits it to be greatly extended.

Other Materials

I shall not here go into details; I wish only to point out, that the dispergation abilities of salts for fibroin are connected by quite a similar series of

(*Continued on page 284*)

Some interesting recent methods of molding gears will be described in July PLASTICS

Rise of the Button Industry

The first buttons were made of horn, bone and mother-of-pearl, but the synthetics have replaced most of the natural materials in this field

By Dipl. Ing. *Fr. P. Pondorf*

IN the May issue, the beginnings of the button industry were outlined.

The present story is continued from page 332 of last month's Plastics.

Mother of Pearl

There is no real competition between the large producers of mother-of-pearl or simply "pearl" buttons and those who make ivory nut buttons, as the uses of the two types of buttons differ so radically. The largest manufacturers of pearl buttons are located in France, Vienna, some parts of Germany, England and the United States.

Horn and Bone

As styles began to change, horn and bone buttons were introduced, and as buffalo horn began to become available, and was capable of producing a more attractive button than could be made from ivory nut, this branch of the industry also became prosperous, and by 1901 over 3 million cattle horns were imported yearly into Germany, and this amount increased rapidly up to the outbreak of the war.

Thus far we have considered only the natural products which lend themselves to the manufacture of buttons, but at the beginning of the commercial manufacture of buttons no synthetic raw materials were available.

Synthetic and Pyroxylin Buttons

The first synthetic product which was taken up by the button manufacturers was the imitation ivory which was presented to the world by the discovery of the pyroxylin plastics during the early seventies, and especially the invention of Celluloid by Hyatt in 1869.

Celluloid buttons, because of the fact that the material was plastic and could be much more easily manufactured into fancy shapes, and was capable of producing very attractively colored articles, became quite popular, despite the fact that the earlier types of pyroxylin plastics were highly combustible, and presented a fire-hazard, especially in their manufacture. It required thirty years however before a really ideal material for button manufacture was discovered.

Casein Solids

As already described in earlier numbers of **Plastics**, the casein solids were invented during the late nineties of the past century and especially as the result of the research work of Spitteler, who, backed by the Harburger Gummiwaaren Fabrik, produced the first commercial casein solid known as Galalith. This led to the founding of the large firm International Galalith Gesellschaft Hoff & Co., with immense plants at Harburg, in Germany, and the commercialization of the casein solids.

The great varieties of color combinations and mottled effects possible with the casein solids, and the fact that this raw material lends itself so admirably to the manufacture of buttons, especially by methods which had become standardized for the older raw materials, soon made the casein solids the most desired substance for the production of the ever-useful button.

Whereas the manufacture of buttons from ivory nut, horn and pearl gave rise to a very large amount of unavoidable waste, the fact that the casein solids could be furnished in either sheets or rods added to the usefulness of casein solids. As is well known, casein solids are made from the nitrogenous solids of skim milk, mixed with suitable coloring matter, and hardened with formaldehyde. In Europe the word "Galalith," although trade-marked by its originators, has become virtually synonymous with the casein solids. The name is derived from two Greek words: Gala - milk, and lithos - stone, or literally, "milk-stone;" a very appropriate and well formed name.

Manufacturing Problems

The development of the button industry was due, especially in its early days, to the firm of Sylbe & Pondorf Maschinenbaugesellschaft of Schmolln, in Thuringia. This firm designed practically all the automatic button-making machines in use in Europe, and has also supplied most of the American trade as well. Statistics collected by this firm for the years 1922 to 1924 show that of all the buttons manufactured in the world, the following percentages represent the raw materials used:—

Artificial horn, including casein solids	55%
Ivory nut	25%
Pearl	7%
Metal	9%
Natural horn	3%
Bone	1%

The vogue of artificial horn or casein solids buttons has given rise to a large industry in this raw material in other countries than Germany; such as the Erinoid Co. in England and the United States; the Karolith Corporation, Aladdinite Co., American Machine & Foundry Co. (Inda), and others in America. In France most of the large producers of pyroxylin plastics

(*Continued on page 284*)

FIBERLOID

A Pyroxylin Plastic Material

SHEETS, RODS, TUBES

Uniform in Color
Excellent Working Qualities
Seasoned to Suit Your Requirements

Clear and Mottled Opaques and Transparencies, and the latest Sea Pearl Effects

FURNISHED IN THE LATEST, MOST POPULAR COLORS

Fiberloid is used for Automobile Curtains, Optical Frames, Piano Keys, Wood Heels, Hair Ornaments, Jewelry, Buttons, Cutlery, Toiletware, Toys, Advertising Novelties and numerous other purposes.

Samples and prices on request

The Fiberloid Corporation

Works & General Offices
Indian Orchard, Massachusetts

New York Office
402 Fifth Avenue

Chicago Office
Room 1512 No. American Building

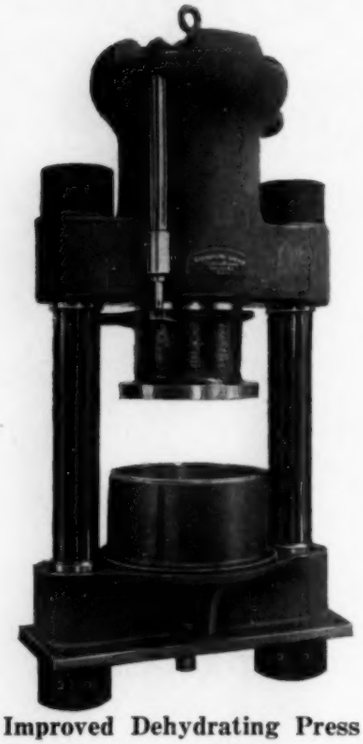
JOHN J. CAVAGNARO

Engineers and Machinists

HARRISON, N. J.

Established 1881

PRESSES FOR
DEHYDRATING
FILTERING
CAKING
POLISHING
STUFFING
ETC.



DIE PRESSES AND DIES
STEEL STEAM PLATENS
SEMI STEEL CAKE PLATES
SLICING MACHINES
CAVAGNARO-LOOMIS VACUUM MIXERS

Improved Dehydrating Press

MACHINERY FOR CELLULOID AND PLASTIC MFRS.

Special Representative

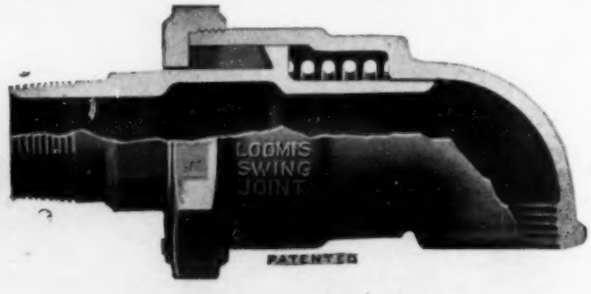
810 BROAD ST. **EVARTS G. LOOMIS** **NEWARK, N. J.**

LOOMIS SWING JOINTS

The Guaranteed Solution of Your Flexible Connection Problems

The Joint With Ten Years Successful Service

Order them now



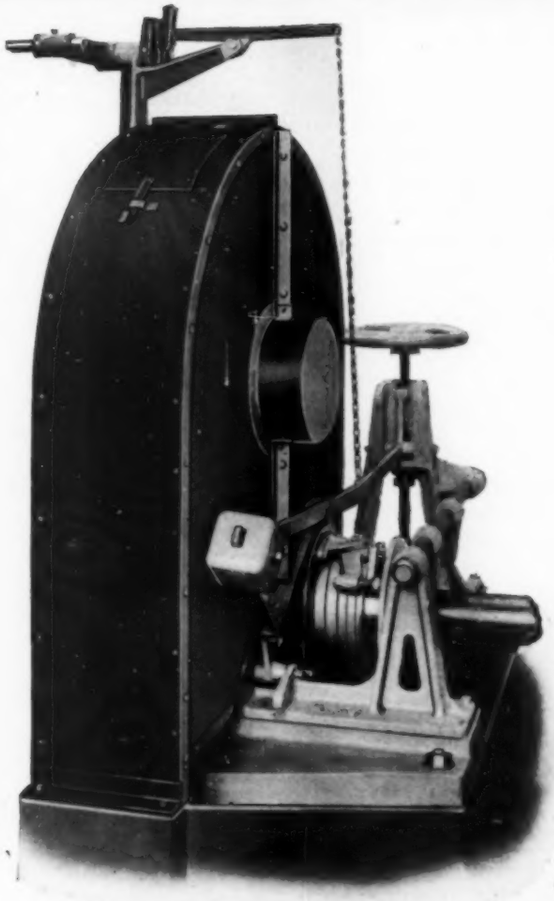
Standard With Many Leading Manufacturers

Send for our Bulletin "L"

EVARTS G. LOOMIS CO.

A Product of EVARTS G. LOOMIS CO. 810 Broad St. Newark, N. J.

FARREL
REG U.S. PAT. OFF.



FARREL COIL
FRICTION CLUTCHES

For economical and efficient driving of rolls used in the manufacture of plastics.

Made in many sizes and for various applications.

Brake and safety release are mechanically operated.

Made by
Farrel Foundry & Machine Co.
Est. 1848
ANSONIA, CONN.

EVARTS G. LOOMIS
Special Representative
810 Broad St. Newark, N. J.

—SOMETHING NEW—
Carver Laboratory Hydraulic Press
FOR
Plastic Moulding and Other Uses
A small Press at a low price. Self contained with hand pump.
Gives any Load up to 20000 lbs. Adjustable, weight 115 lbs.
Glad to send Circular.
Manufactured by
FRED S. CARVER
HYDRAULIC ENGINEERING AND EQUIPMENT
90 WEST STREET NEW YORK
Also sold by E. G. LOOMIS CO., 810 Broad St., Newark, N. J.

The Use of Asbestos in Plastics

The particular grade sometimes known as Micro-asbestos is especially useful as an inert and heat-resistant filler

By Heinrich Rosenberg

From Kunststoffe, 1927, 17, 55

A RECENT article in the German periodical *Kunststoffe* deals with the utilization of finely divided or short-fiber asbestos, as a filler in various plastic materials, and especially such asbestos as is readily obtainable in Europe.

Inasmuch however, as America also produces large amounts of short-fibered asbestos and asbestos flour, this article may prove of interest to the readers of Plastics.

VERY little has appeared in the trade literature on the subject of the utilization of asbestos flour, with the exception of a German work entitled "Ueber die Verwendung von Asbest, insbesondere des faserlosen, in der Technik," by Dr. T. Nieszytka-Norman, of Berlin. This, as long ago as 1914, gave a complete account of the utilization of the raw material in the heat-insulating industry, building trades, electrotechnical industries and ship-building and the like.

In order to provide the workers in the field of plastic materials with various practical formulae for the utilization of finely divided or "micro" asbestos in plastic materials, I am publishing the following details which are known to me or which I have obtained by a study of the relevant literature on the subject.

The fine or 'micro' asbestos has approximately the following composition:

Silicon dioxide	49.81%
Aluminum oxide	2.19%
Iron oxide	2.80%
Magnesium oxide	27.96%
Calcium oxide	13.21%
Water	3.91%
Manganous oxide	traces

Electrical Insulation

One of the chief uses of the fine asbestos is the production of molded electrical insulation, as it presents great advantages over the long-fibered asbestos, as the latter is very difficult to distribute uniformly through a molded piece, and also will not flow properly in a mold, whereas, the micro-asbestos does not suffer from these defects. When using micro-asbestos as a filler, perfectly smooth molded objects are obtained, and this material is a successful substitute for wood pulp, wood flour, barytes and similar fillers.

The peculiar voids existing in the particles of the micro-asbestos give the finished objects a certain smoothness and softness which is often very desirable, and only when exceptional strength and stiffness are desired is it advisable to incorporate also some long-fibered asbestos or cellulose fibers.

The following formulae have been found to yield good molded electrical insulating material:

1.	Artificial resin	50 parts
	Micro-asbestos	50 parts
2.	Artificial resin	50 parts
	Unbleached cellulose	25 parts
	Micro-asbestos	25 parts
3.	Artificial resin	100 parts
	Micro-asbestos	100 parts
	Long fiber asbestos	2 parts
4.	Liquid artificial resin	35 parts
	Micro-asbestos	65 parts
5.	Solid artificial resin	25 parts
	Micro-asbestos	75 parts
6.	Artificial resin	100 parts
	Micro-asbestos	100 parts
	Fibrous asbestos	4 parts

The micro-asbestos is sharply dried immediately before use, then mixed with the binding materials and molded in steel molds which should be heated to 350° C. For radio parts this material has given excellent results.

Among some of the other uses for micro-asbestos in molded products, I may briefly mention the following:

Fired masses can be produced by mixing micro-asbestos with the slag, resulting from the production of titanium in electric furnaces, the slag being mixed with the asbestos while still molten. The resulting material is almost infusible and capable of being used as a furnace lining.

Artificial stone is made with micro-asbestos as a filler.

A material made from very finely ground lignite coal, and known in Germany as "Mellogen - Physomellogenmasse," is mixed with micro-asbestos and worked up into an electrical insulating material.

Plates for monuments and the like are mixed with micro-asbestos to increase their fireproof properties.

Use With Gypsum

Several patents have been taken out by the Plauson Forschungsinstitut (Research Institute), for the production of plastic masses containing powdered or micro-asbestos.

An especially useful product is obtained by the admixture of micro-asbestos with calcined gypsum. This is productive of plaster casts which harden slowly and have considerable porosity, and if the percentage of micro-asbestos is fairly high, yields molds which are applicable to the precision-casting of metals. It has been found possible by making forms from this mixture, to cast screw-threads which are directly usable without further machining. The process is called

"Fertigguss" or "Prazisionsguss," which means "precision" or "finished-casting."

A further alternative is to mix the micro-asbestos with an aqueous emulsion of ceresin or earth-wax and then to form it into articles under pressure, together with gypsum. When making plaster of Paris forms for use in the ceramic or porcelain industries, the addition of micro-asbestos yields forms which will withstand more pressure, and which are also more porous so that they more readily take up the "slip" or clay mixture when forming the ceramic ware.

A mixture of micro-asbestos and Portland cement can be dampened with water and then molded and allowed to harden.

In Molded Goods

Plastic material suitable for electrical insulation can be produced by mixing micro-asbestos with either gum benzoin or gum acaroid, the finished material being practically infusible. Another possibility is the production of molded objects from a mixture of the asbestos with magnesite and magnesium chloride (Sorel cement). The final hardening of such masses is best accomplished under vacuum. A mixture of 3 parts of micro-asbestos and 1 part of molten sulfur yields a product which is both a good heat insulator as well as an electric non-conductor.

A sort of papier-maché can be made from paper waste, micro-asbestos and either glue or starch-paste.

A material known as Ernolith, somewhat similar to the casein solids, but made from waste yeast, is produced by an admixture of yeast, glue, starch and mineral fillers, including micro-asbestos. When using shellac for making plastic molded products, it is possible to add as much as 15% of another resin and then to use micro-asbestos as one of the fillers. In place of the ordinary binding materials, asphalt, tar or pitch may be employed to agglomerate the

(*Continued on page 286*)

Terkelsen Mechanical Presses

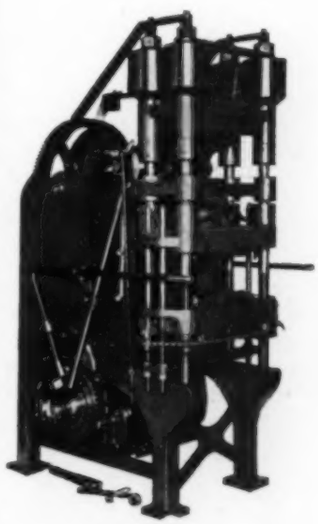
Number Two of a Series

"a small investment"

No elaborate system of installation is required with a Terkelsen Mechanical Press. It is a complete moulding unit in itself, ready to operate as soon as received. No accessories are needed, and thousands of dollars in plant equipment are thereby saved to the manufacturer.

The Terkelsen Press, Type A-1, Model 50, is built on the same principle as Type A-1, Model 100, but is limited to 50 tons capacity. Both models can be used either as semi-automatic or plain presses.

All the regular Terkelsen features are found in this press including individual motor drive, compound gearing, cam and toggle and spring "accumulator".



Type A-1 Model 50

Capacity . . .	50 tons
Working Area of Platens . .	16¾"x12"
Stroke	5"
Maxium Adjustment of Upper Die Block .	10"
Motor	1 H. P.
Approximate Weight . .	4000 lbs.

Automatic Knockouts

TERKELSEN MACHINE COMPANY

330 A Street Boston, Mass.

EDITORIAL · IMPRESSIONS

Just a Word of Explanation

The average desk dictionary has not as yet recognized the noun "Plastics", but contents itself with the adjective, and only the large Century Dictionary defines the word as meaning, essentially, materials capable of being formed by molding or pressure.

However, for many years the U. S. Patent Office has had a class (18) called "Plastics", but apparently found need for still another classification (106) called "Plastic Compositions." From this point of view, "Plastics" and "Plastic Compositions" embrace a very wide field, in fact any product that at some stage of its preparation exhibits plastic or moldable properties is properly called a plastic material. In this way *Plastics* should include the ceramics, cementitious materials such as the various plasters, mortars and cements, asphalt paving compositions, artificial stone, terra-cotta and other purely inorganic moldable materials, all of which eventually become hard and non-plastic.

Meeting a Need

So large a field could, however, hardly be encompassed within the pages of one magazine, such as *Plastics*, and as the industries served by the wider application of the term are so diversified in interests, would not present sufficient material to engage the attention of any group of readers who feel that they have problems in common.

It was to meet the needs of a vast and extremely rapidly growing industry that *Plastics and Molded Products* was founded, and the remarkable growth of the publication is convincing that this need was real and urgent.

As our circle of readers has recently become very much enlarged, the astoundingly large volume of correspondence that the advent of the *Molded Products* section brought clearly demonstrates the great interest shown in commercial articles that are produced by pressure molding. It is believed opportune to re-state the aims of this publication and the industries it earnestly strives to serve.

To the average lay reader, "plastics" is a rather indefinite term, and the questions propounded in the numerous letters which we have attempted to answer within the past few weeks plainly show that there is still a dearth of information on the subject of "what IS a plastic."

Our Own Domain

"Plastics" as we view them, are materials which by virtue of their inherent property of plastic flow under heat lend themselves to mass production of absolutely uniform parts by molding operations. We also include materials molded in the cold which can afterwards be so treated as to render their shape and form permanent. We exclude, however, such substances as glass, ceramics in the older sense of clay products, and such materials as are cast or molded when mixed, with water, as for instance Portland cement, gypsum or plaster of Paris and similar purely mineral substances, except insofar as they are employed in the production of shaped articles by pressure molding. By the latter term we mean fairly high pressure, such as is produced by hydraulic presses or their mechanical equivalents.

While this may appear to limit somewhat our realm of activities it will be very apparent that there remains a very large and fertile field of human endeavor, for the plastic molded materials are today replacing innumerable other formerly stable raw products such as wood, natural stone, metals and many ceramic and glass objects.

As at present constituted, "Plastics" are fairly well naturally classified into six distinct types, each of which has one or two leading materials exemplifying certain definite properties. When we mention

(*Continued on page 277*)

PLASTICS

And Now Success!

In our May issue we commented upon the unfortunate disasters that had overtaken the transatlantic flights, and had headed our article "Fight on."

The May number had hardly reached our readers when the world was thrilled by the stunning success of the young American flyer, Charles Lindbergh, who, in the short span of 33 hours had bridged the Atlantic and had thus written a flaming message across the sky, apprising us of what we might expect on a not distant day.

Now that the way has been shown, rapid development is a foregone conclusion. Truly the world is getting smaller, and for this reason developments in what we now still choose to term "foreign lands" are of more importance than formerly. No barriers artificially created, such as tariff walls and embargos, will long suffice to prevent competition with our own producers and dealers.

Only by keeping abreast of the times, and if possible, a few jumps ahead in creating new ideas and in adopting advanced methods is commercial, or, for that matter, any form of success possible.

So, no matter what your particular line may be, *keep at it.*

Explanations

(*Continued from page 276*)

some of these by name, it is because in almost every instance that particular material has been the first in its particular field, or at least has attained such prominence by long usage as to stand for such a definite type.

Pyroxylin

First, there are the pyroxylin plastics, of which *Celluloid* is the original example. These are made from nitrated cellulose (cellulose nitrate), with the addition of camphor or some substitute for the same. They are highly plastic when hot, fairly rigid when cold, and have the very desirable property of being at all times again amenable to further shaping or molding on reheating. They are never found in the permanently hard and infusible form as some other materials in the other groups. The relatively non-inflamable other cellulose esters and ethers, as cellulose acetate and ethyl cellulose also belong to this group.

Casein

Secondly, there are the casein plastics or solids. These are based on the proteid found in milk, or casein. These are comparatively rigid when cold, but slightly plastic when hot, and usually worked by machining. Their inclusion in plastics however is fully justified as they are molded and pressed during their preparation, and so closely resemble the pyroxylin plastics in external appearance that they are true equivalents of the former for most purposes. They are not inflammable. The earliest commercial product was *Galalith*. Other proteid plastics, as gelatine, keratin and chitin also fall into this class.

Phenol Resins

Thirdly, there are the synthetic resins, of which *Bakelite* is the outstanding achievement. These resins most commonly made from phenol (carbolic acid) and formaldehyde, provide molding powders that weld

(*Continued on page 280*)

Recognized the World Over as the Clearing House for

SCRAP CELLULOID AND FILM

Johnson Products Co., Inc.

Four and one-half acres devoted entirely to the reclaiming of scrap celluloid film and similar products

Johnson Products Co., Inc.

General Offices and Plant

Garfield, New Jersey, U. S. A.

TECHNICAL ABSTRACTS
AND PATENT REVIEW

Manufacture of Combs. A. Jaeckel. Die Celluloid Industrie (Gummi-Zeitung), 1927, 41, 1309.

This is a detailed and interesting account of the European practice in making combs from horn, celluloid, and similar products. As **Plastics** has already described the manufacture of horn combs in great detail (1925-1926), this article will be interesting as a comparison between the technique of the U. S. and Europe. A number of illustrations of horn presses, saws, cutters, etc., are shown.

Sulfur-chloride-proof containers and varnishes. Rudolf Ditmar, Gummi-Zeitung, 1927, 41, 1348.

Sulfur chloride (monochloride or S_2Cl_2) is a liquid which is very corrosive and hence difficult to transport. It is usually shipped either in glass or stoneware crocks and carboys, or else in sheet-iron drums lined with lead.

The author points out that various plastic materials, especially when used to impregnate or coat containers of other material, are quite resistant to sulfur monochloride, both in the liquid, gaseous or dissolved form. Among these are cellulose acetate (Cellone and Cellite). The cellulose ester when dissolved in acetone, amyl acetate, hexaline acetate or mixtures of these solvents can be employed as a varnish over wooden forms or containers which are to be used for holding sulfur chloride that is used in cold vulcanization of rubber, etc.

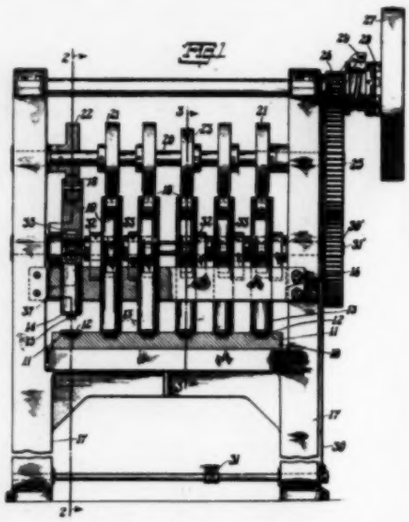
Phenol resins, especially Bakelite C, are also very well suited for impregnating or coating containers for sulfur chloride. Metallic tanks, etc. are coated with Bakelite varnish which is afterwards heated in a "Bakelizer" to harden the phenol resin into the insoluble or "C" stage.

Novelty Tooth-brush, Stephen A. Neederman, U. S. P. 1,619,212; March 1. 1927.

The main point of novelty lies in the provision of a mirror in the back of the handle of the brush to permit of inspection of the user's teeth. Either the tooth brush can be made with the mirror, or a separate holder provided for attachment to ordinary tooth brushes. The mirror is covered by a sliding cover when not in use.

Button making machine. Leon H. Bean, assignor to Hollander-Langee, Inc., U. S. P. 1,619,233; Mar. 1, 1927.

The machine is especially suitable for making buttons from semi-plastic material, such as horn, casein solids, etc. The machine operates simultaneously upon a plurality of button blanks in timed relationship,



so as to make faster production possible, for the plungers will be working on one button while a second plunger will be in an inoperative position, so that the operation becomes practically continuous.

The illustration gives a fairly comprehensive idea of the machine, which is cam-actuated.

Lacquer and Lacquer enamel. Stanley D. Shipley and Guy C. Given, assignors to Atlas Powder Co., U. S. P. 1,618,482 and 1,618,483; Feb. 22, 1927.

Cellulose nitrate lacquers, which are at present becoming increasingly important in the varnish and lacquer field, can be made in such a manner that they approach the older types of varnishes in properties. The present invention relates to the utilization of propyl and butyl ethers of ethylene glycol as solvents for cellulose nitrate.

The inventors state that these ethers of ethylene glycol are not only most excellent solvents for pyroxylin, but that solutions containing these materials may be diluted more than is usually the practice by such non-solvents as benzene without throwing the pyroxylin out of solution. The films obtained on evaporating solutions of pyroxylin containing propyl or butyl ethers or ethylene glycol are said to be as strong and supple as if castor oil or the like had been used.

Lacquers containing cellulose nitrate in conjunction with ordinary esters such as damar, kauri, etc., are described. Various formulae and directions for compounding are also included in these two patents.

Molding terminal banks for telephone circuits. John J. Lyng and Lloyd E. Wood, assignor to Western Electric Co., U. S. P. 1,595,107; Aug. 10, 1926.

The invention may be employed for making terminal banks of large size involving a large number of terminals such as form part of an automatic collector switch in telephone exchange systems. A composite article is formed by super-imposing alternately electrical conducting strips and strips of a phenol resin plastic composition and curing the assembled strips into a uniform structure. The electrically conducting strips are somewhat larger than the phenol resin laminae, and are hence available for making the desired connections.

Here is still another example of the great diversity of the field covered by molded products.

Refining aldehyde resins. Willy O. Herrman and Hans Duetsch, assignors to Consortium für Elektrochemische Industrie G. m. b. H.; U. S. P. 1,596,971; Aug. 24, 1926.

Resins obtained by the condensation of acetaldehyde in the presence of alkalies are not very resistant to water. This property can be removed, and the resins very much improved by a prolonged treatment with water. For example 100 parts of the resinous condensation product obtained by condensation and polymerization of acetaldehyde are ground for several hours in a ball mill or the like with 200 parts of a 3% solution of acetic acid, a fine suspension of smelled resin particles being obtained. The resin is filtered off and melted. The product is similar to shellac, copal amber and the like, and soluble in the usual organic solvents. It is also capable of use in varnishes and lacquers, etc.

Phenol-acetaldehyde; and phenol-paraldehyde condensation products. Leo H. Baekland and August H. Gotthelf; assignors to Bakelite Corporation. U. S. P. 1,598,546; Aug. 31, 1926.

Phenol and paraldehyde are condensed in presence of hydrochloric acid. The product, while liquid at first, and fusible, becomes infusible when heated from 100 to 200°C. The remarkable thing about this condensation product however is that if the heat is raised still further say to 218°C it will again melt, giving off some gases and undergoing incipient decomposition. This differentiates the product from other known condensation products.

This resin is not hardenable by itself, and can be used for molding in a manner similar to the fusible

resins; however by also incorporating formaldehyde-yielding products with the molding composition, the new resins can be hardened much in the same manner as the standard phenol-resins.

The products are primarily intened as molding compositions.

Stabilizing Cellulose Acetate. Harry S. Mork, assignor to Lustron Co., Inc., U. S. P. 1,607,474; Nov. 16, 1926.

About 2% of an organic acid salt of an alkali metal is added to cellulose acetate as a stabilizer; especially such acetate as is to be employed for making artificial silk. Materials suitable for the purpose are said to be: sodium and potassium acetates, sodium and potassium oleates (i. e. soaps), sodium salicylate, benzoate or the like. The potash soaps of vegetable oil acids are preferred. As lit tle as ½% will suffice.

Lacquer and Lacquer Enamel. S. D. Shipley and G. C. Given assignors to Atlas Powder Co., U. S. P. 1,618,-481 and 1,618,484; Feb. 22, 1927.

1. The ethyl ethers and methyl ethers of ethylene glycol are employed for making lacquers from either cellulose nitrate or acetate; non-solvents such as benzene, gasolene, alcohols and the like being also added. Use of regular plasticizers and various oils is permissable.

2. Covers similar ground but is specific to amyl glycol.

Resins, pigments, plasticizers, organic crystalline substances such as salicylic acid are also used.

Neutral resin from gum accroides. Karl H. T. Pfister, assignor to Rohm & Haas Co., U. S. P. 1,608,-421; Nov. 23, 1926.

A neutral and less highly colored resin is prepared by the esterification of commercial gum accroides. 92 parts of this gum are dissolved in 650 parts of alcohol and 38 parts of a sodium hydroxide solution of 40° Be. strength, and the solution brought to the boiling point, whereupon 106 parts of para-toluene-sulfonchloride are added. A tough mass immediately separates out, which on the addition of water becomes solid. It forms a resin soluble in benzene and in butyl acetate, insoluble in alcohol and petroleum distillates. The new product is useful for making varnishes and lacquers.

Resins from cracked petroleum distillates. J. C. Morrell, assignor to Universal Oil Products Co., U. S. P. 1,608,135; Nov. 23, 1926.

It was found that various absorbent materials, such as fuller's earth, bentonite and various types of clays would not only remove suspended resinous matter from cracked hydrocarbon fluids, but would actually absorb resinous materials from the liquids. The cracked distillates are simply distilled in presence of the absorbing agent, whereupon the latter is treated with solvents. The recovered resins are said to be suitable for making varnishes, and in place of shellac.

Some novel ideas in Combs. See July

INCREASED PRODUCTION

and A Reduction in Mold Costs are the Outstanding Features of this

Semi-Automatic Molding Press

WITH

Independent Hydraulic Ejectors

This press has been designed to eliminate some of the recurring mold costs by incorporating certain features into its construction, which ordinarily have to be incorporated in each mold, making it more adaptable to all classes of molds. The operating and mechanical advantages of this press are as follows:

1. Hydraulically actuated ejectors top and bottom. These are operated independently of the main ram and allow the operator to eject molded pieces at any position of the main ram, thereby saving time.

2. Hydraulic reseating of ejector pins and hydraulic operation of ejectors is positive and dependable, which is not the case with spring weighted ejectors.

3. The ejection stroke of the bottom dies is equal to the stroke of the main ram. This long stroke makes it possible to mold deep pieces and eject them without sacrificing any of the press opening.

4. The elimination of top ejector tension rods passing through the top head and bottom platen increases the space available for dies.

5. The bolsters, top head, moving platen and holding down gibs are slotted to allow for varying widths of molds.

The above features tend to increase production and reduce initial mold costs.

WRITE FOR CATALOG

THE WATSON-STILLMAN CO.

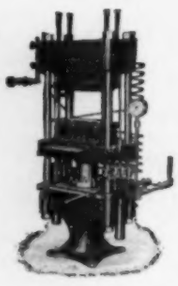
12 Carlisle St., NEW YORK CITY

Chicago Detroit **Cleveland Richmond** **St. Louis Philadelphia**

MOLDING PRESSES
UPWARD or DOWNWARD

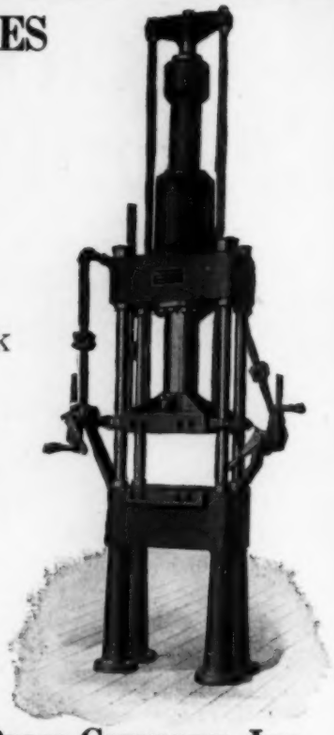
To Suit Your Work

Fig. 1



ANY SIZE
ANY PRESSURE

Let us help you work out your problems



Established 1872

Dunning & Boschert Press Company, Inc.
No. 330 West Water St. SYRACUSE, N. Y.

PLASTIC MATERIAL FORMING PRESSES

METALWOOD

Pumps Accumulators Valves

Drop Forged Steel Fittings

METALWOOD MFG. CO.

3362 Wight St.
DETROIT, MICH.

Explanations

(*Continued from page 277*)

under heat and pressure into objects that are no longer fusible by heat but will retain their shape indefinitely even at temperatures which would warp or even scorch the preceding types of plastics. For electrical purposes they are, at present at least, supreme.

Natural Resins

Fourthly, there are the innumerable moldable compositions based on natural resins, asphalts, shellac, pitch, bitumen, cumarone resins and the like, which when mixed with fillers lend themselves to a very large variety of objects and molding methods. The phonograph record, which is a shellac product, is the best example of this type of plastic.

Synthetic Resins

Fifthly, there are the newer types of synthetic plastics based upon polymerized oils, nonphenolic artificial resins, and condensation products. Among this group *Glyptal* (glycerine and phthalic acid resin) and *Colasta* (an oil product) are the best examples.

Newer Ceramics

Sixthly, there are the recent molded ceramics, such as *Isolantite*, that provide an accurately molded material that becomes an almost perfect refractory on firing.

Our Policy

It is to disseminate information upon the types of plastics just discussed that *PLASTICS AND MOLDED PRODUCTS* was created, and it is the aim and endeavor of the publishers and editors to provide this information in a form that is readily grasped even by the nontechnical reader. If, in doing this, we sometimes appear to be rather elementary in our descriptions and seem to repeat certain types of articles at short intervals, we sincerely trust that our better informed and more learned readers will peruse our pages with an understanding heart.

Manufacture of Casein Solids

(*Continued from 268*)

of the cylinders is adjusted by hand wheels. The horizontal position of the cylinders is also easily adjusted.

The grinding cylinders run on large ball bearings, which not only take up the rotational friction, but also that caused by the reciprocal movement of the cylinders, as these move back and forth a short distance while revolving, so as to render all grinding-marks on the plates impossible. The roughing cylinder runs about 1200 r.p.m., and the finishing cylinder about 1600 r.p.m. One or both of the cylinders can be quickly and easily thrown out of gear. The sandpaper is held by a simple device, and fresh supplies of this grinding medium can be placed in the machines with a minimum of time and effort. The tension under which the paper works is maintained automatically.

The machines have two speeds, that is for forward movement of the plates under the grinding cylinders. The usual speed is 4 square meters of casein solids plates per minute, or about 16 plates per minute, ground on one side. From this it will be evident that the output of each machine is quite high. The dust produced is drawn off at the point of origin by suction ducts.

Advantages

Besides the production of casein solids plates of absolutely uniform diameter, the grinding down of the plates on these machines has another considerable advantage. This lies in the removal of the superficial very hard "skin" of the casein solids. Unless the skin is removed, as it is by this grinding, the cutting and machining of the plates become quite difficult. For this reason the fabricators prefer the ground plates, and besides, such plates will polish more quickly, and give a higher polish.

The fabricators of casein solids, by purchasing ready ground plates from the producers, save in two ways: they have no loss

PEARL ESSENCE

Super Quality Pigment

in

Paste

Lacquer

or

Solvents

STANDARDIZED

Samples forwarded on request.
Or
Send your Articles to us and our Chemical Dept. will produce the required finish and formulae for you.

Jos. H. Meyer Bros.

Manufacturers of Richelieu Pearls

220 Twenty-fifth St., Brooklyn, N. Y.

New England Representative, E. W. Wiggins, Leominster, Mass.

Offices

New York—Philadelphia—Chicago—Los Angeles

Semi-Automatic
80 Ton Bakelite Press

Moulding Presses

For all Plastic Materials

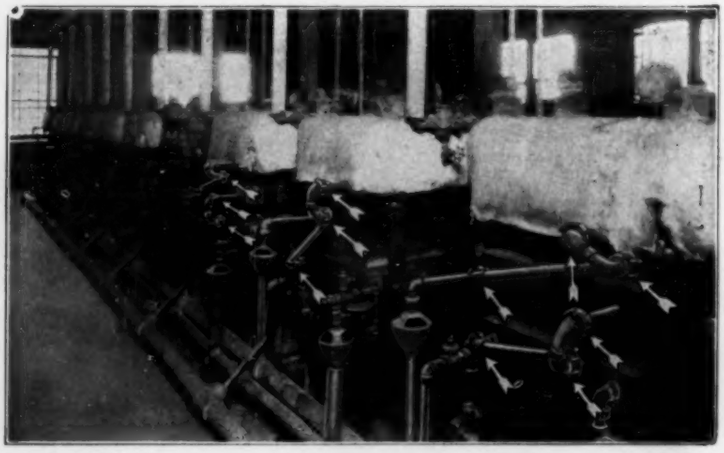
This cut shows one of ten presses with adjustable ejectors on both top and moving platens.

The high and low pressure operating valves are manipulated by an automatic electric valve control, without cams or shafting.

We manufacture hydraulic presses for all hot and cold moulding processes and also complete equipment including hydraulic accumulators, pumps, valves and piping.

Write for our pamphlet—
A new Automatic Control for Hydraulic Machinery.

R. D. WOOD & CO.
PHILADELPHIA, PA.
Established 1803 Works: Florence, N. J.



FLEXO *Joints*
(Patented)

Style "B" Style "F"

and pipe make the ideal connection between platens on molding presses. Made of steam brass, absolutely rust proof and will last for years. FLEXO JOINTS are as simple as they are efficient. No packing is required; there are no ground parts. High or low pressure seals the joint —tight.

Sizes from ¼-inch to 3-inch—standard iron pipe threads
Complete bulletin mailed free.

FLEXO SUPPLY COMPANY
4469 Manchester Ave. ST. LOUIS, MO.

in weight to contend with, and save one operation. Needless to say the producers charge somewhat more for ground sheets than for plain pressed stock, but the difference is well worth it.

(*In our next installment we shall take up in detail the formation of blocks of casein solids from which sheets can be planed. This method is comparatively recent, and is capable of yielding results unattainable by other methods*).

Safety Aids

(*Continued from page 264*)

by I-D-L Auto Glare Check Device Co., of Canton, Ohio. Both appliances consist of pieces of green pyroxylin plastic sheet. The former is attached to the glass by means of a vacuum cup, moistened in cold weather with glycerin, the latter is keyed to the head-light bulb.

Borrowing its name from the British nickname for policeman, the "American Bobby," a new automatic traffic control is guarding the safety of both pedestrians and motorists at crossroads. It is being marketed by the Griswold Safety Signal Co., Minneapolis, Minn., and is fitted with green, red and amber Pyralin pyroxylin plastic sheeting.

Another artifice assisting the automobilist is the "Lecko Change-O" manufactured by the Klopp Printing Co., Omaha, Neb. This consists of a metal holder containing a number of memorandum sheets, protected by a Pyralin transparent cover. Whenever new oil is put in, the motorist adds 500 or whatever the number may be, to his mileage and marks his sheet with the proper entry.

Anti-Frosters

The article on the "Anti-Froster" in March Plastics (page 124) appears to have aroused considerable interest. This device is not cemented to the glass but like the "Glare Check" already described, is attached to the windscreen by means of a rubber vacuum cup. Sheet 15/1000 and 20/1000 thick is

used according to the price of the device. In some instances, individual operators have simply used sheet material, cut to size, and fastened to the glass by means of adhesive tape. Cementing the sheet in position is impracticable as not only would it be difficult to remove, but a smear hard to clean off would remain.

Zyl Frames

(*Continued from page 266*)

introduced at 11 will glide out upon an endless carrier 28 which is carried by the rollers 29. The action of the extruded material will be sufficient to operate the endless belt 28 if the rollers 29 are adequately lubricated and disposed within suitable bearings. As in the first instance, after the extruded sleeve or elongated blank 21 has sufficiently cooled it may be cut up as shown in Figure 6 thus forming the blank as illustrated in Figure 7.

In Figures 4 and 5 another slight modification is shown, wherein the composition is forced or extruded within a suitable mold formed by the sleeves 30 and 31. The sleeves 30 and 31 are held in parallel spaced relations by means of the outer web portions 32 located at the opposite end of the mold to that in which the composition is forced or extruded, thereby allowing the complete nonmetallic blank to be formed with continuous rims, as shown in Figure 5. These sleeves are likewise carried by a removable plate 14 located in the front face of the container 10. The inner end of the sleeve 31 is closed as by the plate 33, so that the cellulose composition will assume the proper shape as in the other modifications of this invention.

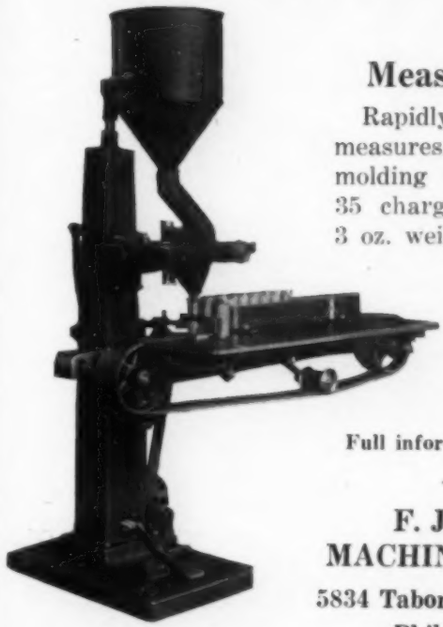
In the present instance, however, the zyl composition is formed into the desired shape in its initial working, and instead of forming flat sheets and then cutting the blanks from such stock the composition is extruded into the shape of an

FJS

DON'T WEIGH

FJS

Measure Your Bakelite



STOKES
Measuring Machine

Rapidly and Accurately measures Bakelite and other molding materials. Capacity 35 charges per minute up to 3 oz. weight.

We also manufacture a complete line of

Preforming Presses

Full information on request.

F. J. STOKES MACHINE COMPANY
5834 Tabor Road, Olney P. O.
Philadelphia, Pa.

Southwark Hydro-pneumatic Moulding and Curing Press

No Pumps or Accumulators
are required to operate
This Southwark Standard
HYDRAULIC PRESS

Operates on Air or Steam Pressure—Requires little space—Simple in operation. Ideal for small shops, laboratories, etc.

The Hydraulic Press illustrated above is designed to operate on Air or Steam Pressure. This eliminates the usual pump and accumulator equipment and makes an efficient and inexpensive installation. Let us tell you about it.

SOUTHWARK
Foundry and Machine Co.
402 WASHINGTON AVENUE
PHILADELPHIA, PA.
AKRON, O. CHICAGO, ILL.

"PAISPEARL"

wherever used always means

MORE BUSINESS

Use pearl sheeting made with "PAISPEARL"—it does not discolor, or become brittle in working, and is not poisonous or harmful in any way or use.

Coat your products with the lustrous "PAISPEARL" finish and increase your sales.

Paste and solutions for spraying or dipping giving a lustre beyond compare.

Samples coated free. Further information on request.

PAISPEARL PRODUCTS, *Inc.*

65 NASSAU STREET NEW YORK CITY

LABORATORIES—Eastport, Me.
Yonkers, N. Y.

KNOWLEDGE and EXPERIENCE

One of the men in this organization is a graduate chemical engineer with fifteen years experience among the largest pyroxylin plants. His practical and experimental training is at your service.

E. W. WIGGINS

LEOMINSTER, MASS.

New England Representative for

NIXON NITRATION WORKS

and

JOS. H. MEYER BROS.

NACROLAQUE NIXONOID PEARL ESSENCE

in

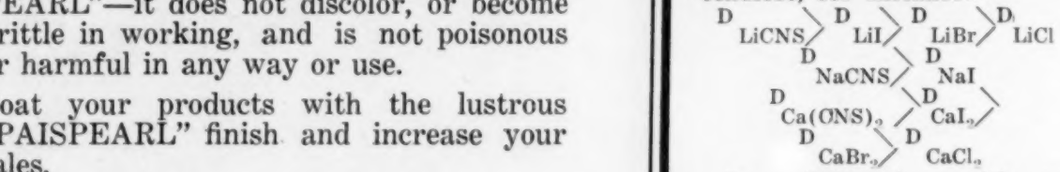
Sheets Rods Tubes

elongated blank which may be, after it has sufficiently cooled and seasoned, if desired, cut up into numerous ophthalmic blanks which are ready for shaping and polishing and then used.

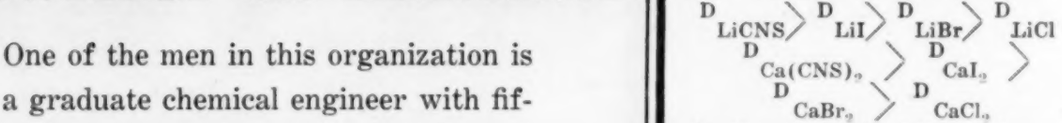
Chitin

(*Continued from page 269*)

inequalities such as exists for cellulose, for instance:



In collaboration with my pupil S. Utzino, we succeeded in establishing the fact, that chitin (being prepared from the internal shell of sepia; also chitin from a Japanese kind of lobsters "kuruma-ebi" being used in some of the experiments) is also convertible into the plastic state, as well as into the state of colloidal solution by means of aqueous salt solutions, (as might have been expected a priori, of course, since chitin like cellulose, is a polysaccharide, but containing nitrogen); the following inequalities, similar to those for cellulose, exist for chitin, for example:



in the solution of the last mentioned salt, chitin dispergates with difficulty.

(*This article will be continued in the July issue.*)

Buttons

(*Continued from page 270*)

have taken up the manufacture of casein solids. The future of the button industry will be closely interwoven with that of the casein solids, especially for such buttons as are used for women's wear.

Development

It was only natural that the development of suitable machinery for the economical manufacture of buttons should have been developed in the home-city

of the button industry, Schmolln, in Germany. The progress made in the mechanical refinements during the past sixty years has been remarkable. Sylbe & Pondorf have, so to speak, fathered this industry, and have developed automatic machinery that turns out perfect buttons at an unbelievably fast rate, from any of the raw materials.

Throughout the World

It may seem like rank bragging to the uninitiated reader, but the fact remains just the same that every European button manufacturer has been equipped by this one firm, and that virtually the whole world of button-making is indebted to the originators of the automatic machines that alone make buttons at their present prices a commercial production of an economic possibility. The present plant of Sylbe & Pondorf, making button machinery exclusively, employs over 1,000 men, which is in itself an impressive fact exemplifying the importance of buttons in the world's commerce.

It might appear that the further developments of the button industry were naturally circumscribed by the present demand, but as civilization advances, and countries that are now comparatively backward in matters of habiliment and dress take up what is conventionally known as "European" dress, new and absorptive markets for buttons will continually arise.

Another fact that accounts for the endless demand for buttons is that no one ever thinks of salvaging the buttons from his old clothes.

The plastic materials, especially the advent of casein solids, have contributed mightily to the progress made in button manufacture; and as new raw materials are introduced, button manufacturers will be quick to avail themselves of any product that gives promise of lowering production cost or of increasing the possibility of profits by new colors and effects.

SUPPLYING THE DEMAND
For Compressed Air Ballasted
HYDRAULIC ACCUMULATORS

A view of the Shop Erecting Floor
Write for Bulletin No. 623 on Compressed Air Ballasted Hydraulic Accumulators.
No Heavy Ballast-Shocks or Foundations
No Guides, Springs or Bumper Blocks
MINIMUM VARIATION IN PRESSURE
CHARLES F. ELMES ENGINEERING WORKS
1002 Fulton St., Chicago, U. S. A.
Room 310, 30 Church St., New York, Phone Cortlandt 4435
-HYDRAULIC- PRESSES PUMPS ELMES SINCE 1851

J. J. KREHBIEL
381 Fourth Avenue New York

Machinery
for Manufacturing Buttons,
Combs, Fountain Pens, and
Other Articles from
Casein and Composition Products
Brush Making Machinery

Sole Agent for SYLBE & PONDORF

It's H-P-M
for the HIGH PRESSURE jobs

In the PLASTICS INDUSTRY this includes Hydraulic Presses for—

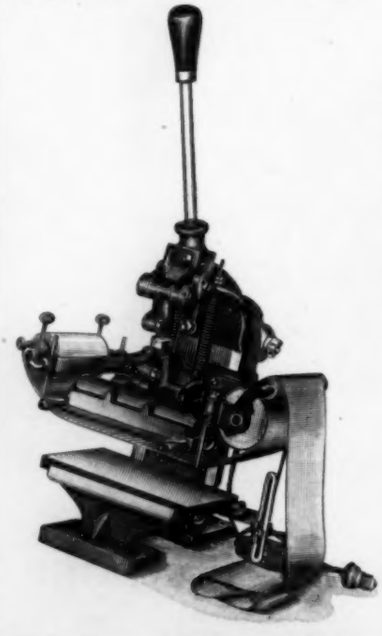
Curing and molding all plastic materials in either hand molds or fixed dies. Sizes and types to economically fit all production requirements. Die Sinking and Hobbing.

Also Automatic Controls for timing any molding cycle; Hydraulic Pumps, Accumulators, Valves and Fittings.

THE HYDRAULIC PRESS MFG. CO.
Engineer - - Builders of
HIGH PRESSURE HYDRAULIC MACHINERY
TWENTY EAST BROAD, COLUMBUS, OHIO
PLANT - MOUNT GILEAD, OHIO.

OUR GOLD INLAYING PRESS
WITH AUTOMATIC ROLL FEED

is just what you have been looking for. Will take Roll Leaf any width to 5". Positive feed from ¼" to 5½". Set ups and adjustments quickly made.



Press is made in three sizes furnished complete with heating units and 3-way switch control.

Presses sold with or without roll feed.

This Press will speed up production. The stroke gives ample clearance to feed in work eliminating the draw plate operation.

Write for full particulars.

STANDARD
TOOL COMPANY
75 Water Street
LEOMINSTER, MASS.

Asbestos

(*Continued from page 275*)

asbestos. The micro-asbestos is also useful in filling or stretching fibrous asbestos masses.

Another type of plastic product to the manufacture of which micro-asbestos lends itself, is the formation of mixtures of the same with either chalk or slaked lime and water or glue solutions; usually also with the addition of rosin, zinc oxide or the like. The hardening agent in such compositions is a solution of zinc chloride. A mixture which produces a good composition bearing a close resemblance to ivory, may consist of: Borax 40 parts, potash 20 parts, lithopone 75 parts, zinc oxide 18 parts, micro-asbestos 12 parts, and an amount of coloring matter depending upon the effect desired.

In Phenol Resin Plastics

The use of micro-asbestos in phenol resin products is also possible, the mineral substance in such cases being incorporated with Bakelite A, and then molded in hydraulic presses. According to the strength of the material required, the amount of filler can vary from 60 to 80 per cent.

Carleton Ellis in his *"Synthetic Resins and Their Plastics"* states further that micro-asbestos is used as a filler in Bakelite, rubber and other insulating materials; for roofing material, as fillers in other phenol-resin products, and in various cementitious mixtures. Phenol resins may be dissolved in alcohol, and mixed with micro-asbestos as a filler.

In making furfural resins, for example, 1 part of micro-asbestos may be mixed with 5 parts of phenol and 5 parts of furfural, and the mixture treated with hydrochloric acid.

Even in products in which long-fibered asbestos has been employed in the past, it is advisable to investigate the possibility of the addition, or substitution in part, of the finer asbestos.

Accessories
For Toilet Articles

TASSI BROS. MIRRORS NEW YORK AND PARIS

Mirrors of the Better Kind for Fabricators of Celluloid Toiletware

We Specialize in French Mirror Plates

Tassi Bros.
525-531 W. 24th St.
New York City

TOILET GOODS

A Monthly Magazine for Buyers of Toiletries and their Sales Clerks.

A sample copy of Toilet Goods and Circulation Analysis will be sent on request.

TOILET GOODS
18 W. 34 STREET
NEW YORK

FOR SALE

Several Liebig No. 2
R & F Brush Machines
and
1 No. 63 Oswego Automatic Cutter

DU PONT VISCOLOID CO., Inc.
ARLINGTON, NEW JERSEY

FOR SALE—Machinery. Complete equipment for a molding plant: Accumulator, Mixers, Pumps, Air Tank, Rolls and Blankers, Hydraulic Presses, Motors. All in perfect condition and ready for efficient use. Address, Box 86, PLASTICS.

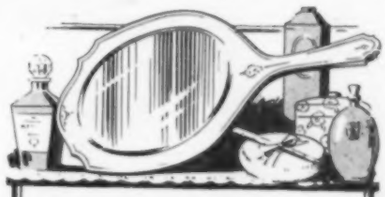
FOR SALE—5 Hydraulic Presses with steam heated plates, used for molding of rubber goods, 1500 lbs. pressure. Also three hydraulic pumps. ACME OIL CORPORATION, 189 N. Clark St., Chicago.

COMPLETE HYDRAULIC outfit for sale, reasonable; discontinuing line. Large mixing roll 30"x10"; blanking roll 6"x6", air pump; hydraulic pump; accumulator, air tank; eight presses; rams 7½" to 10"; also steam tables, pipes and plastic material. Box 74, PLASTICS, 471 4th Ave., N. Y. C.

Argentina Sends More Casein Here

AN increase in 1926 of nearly 7 million pounds in the casein exported here from the Argentine Republic, bears witness to the increasing activity of American manufacturers of casein products. The following figures were supplied to the Department of Commerce by our Consul General at Buenos Aires.

	Pounds	Value
1926	25,802,324	$2,865,312
1925	18,902,217	$1,650,218



Good Mirrors will guarantee approval of your Product

Standard Mirror Co.
151 - 157 HARRISON STREET
Buffalo

WANTED

WANTED

FACTORY SUPERINTENDENT—A young man experienced in the manufacture of toilet articles from Pyroxylin material. Must have thorough knowledge of making Brushes, Mirrors, Combs, and other toilet requisites, particularly from Pearl sheet materials. Must understand machinery, and be familiar with cutting dies, pattern making, etc., etc.

Our factory is located in the middle West, and there are excellent opportunities for advancement. In your first letter state age, experience, and education. Any replies will be considered confidential.

BOX 206,
Plastics, 471 Fourth Ave.

Materials
for the Plastic Industries

Dipping Colors—Cements for Celluloid and Pyroxylin Plastics

Pearl Essence Lacquers

ATOM CHEMICAL CORPORATION
96 E. 10th St., New York City
Tel. Stuyvesant 7184

ASBESTOS
and
CEMENT
of all grades
Samples upon request
E. Gross & Co.
90-96 Avow St.
HARTFORD, CONN.

THE **GUMS** USED
IN MOULDED COMPOSITION
must be properly selected and adaptable to your particular line of manufacture.

RESIN **GUM COMPOUNDS** **COPAL**

FRANCE, CAMPBELL & DARLING, Inc.
Importers
133-37 FRONT ST., NEW YORK

Manicure Steels
for mounting in handles
Nail Files
Cuticle Knives
Shoe Hooks, Pushers, etc.
Made by
C. J. BATES & SON
CHESTER, CONN.

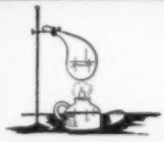
If You Contemplate Going Into
The CASEIN SOLIDS BUSINESS
An EXPERT in this field is willing to co-operate with you. Advice on installation, secret formulae. Most modern approved methods.
Also expert advice on the commercial production of casein suitable for plastic materials.
HEINRICH PREHN
Luisenstrasse 24, Naumburg-Saale, GERMANY
or c/o PLASTICS, 471 4th Ave., NEW YORK CITY

Cellu-Gummed Labels
That stick to Pyroxylin Plastics.
Also Regular Gummed and Ungummed Labels, printed, plain, embossed, die cut, Cardboard Tags, printed and blank.
Economy Ticket & Label Co.
552 7th Ave., New York City

EVERY VARIETY
OF
SHELLAC *and* GUMS
FOR THE
Plastic Industry
Headquarters for COMPO-BLACK, a firm and brilliant base that will lend body and lustre to your moulded products.
LET US HAVE YOUR INQUIRIES.
GEO. H. LINCKS 123 Front St., New York

Phenol U. S. P.
Formaldehyde
Denatured Alcohol
Methanol
Whiting

WM.S.GRAY & CO.
342 Madison Ave.
New York City



Materials
for the Plastics Industries

RENNET CASEIN

BLOOD ALBUMEN
Finely Powdered

Special Grades for Making Plastics

JUNGMANN & CO.
Incorporated
5 Desbrosses St., New York

BOILERS

All Kinds All sizes

Also Ideal Steam Generators without flues.

Write for Catalogues and Prices.

Syracuse Steam Generator, Inc.
Syracuse, N. Y.

Established 1889

The Burnet Company
John D. Newton, Pres.
96 Wall Street
New York

Importers of

WOOD FLOUR
AND
WHITING

Inquiries Solicited

Warehouse
292 Pearl Street
N. Y.

Telephone
John
0199

GUMS
and
RAW MATERIALS
For Moulders of
Composition Buttons
Electrical Radio &
Record Stock

ASPHALT—Gilsonite and Powdered Asphaltum.
COMPO BLACK—
FILLERS — Aluminum Flake, China Clay, Record Black Filler, Talc, Etc.
GUMS—A most complete line of every description.
MICA—Light and Dark—Various Meshes.
WAXES — Carnauba, Montan, Stearic Acid, Stearine and Powdered Wax.

Celluloid Polishes
TRIPOLI
White and Black Polishing Compounds

WILLIAM H. SCHEEL
Importer—Manufacturer
Exporter
179 WATER ST., N. Y. C.

Ground Pure Cotton

For use in all classes of Plastic Composition.

CLEANLINESS AND UNIFORMITY ASSURED

The Peckham Mfg. Co.
240 South Street
Newark, N. J.

A Special
Shellac
For each requirement

Henry W. Peabody & Co.
17 State St.
New York, N. Y.

LUSTRE BLACK

USED IN PLASTIC COMPOUNDS
WILL GIVE BRILLIANCY AND BODY

Working samples furnished free of charge.

ACME OIL CORPORATION
189 No. Clark St.
Chicago, Ill.

CELLULOSE ACETATE

Press Mass Powder

American-British
Chemical Supplies, Inc.
15 E. 26th St. New York City

Wood Flour
For all Plastic and Composition Molders
All grades at market prices

S. S. SPIRO
505 FIFTH AVE., N. Y. C.

CASEIN
ALL TYPES

T. M. DUCHÉ & SONS
376 Greenwich St.
New York City

Essential Books

Plastics and Molded Electrical Insulation.

Emile Hemming. 313 pages. Illustrated. $6.00.

Very special care has been taken in the preparation of the chapter on molded insulation. Contains hundreds of references to plastic and composition products and their utilization in industry.

Casein and Its Industrial Applications.

Edwin Sutermeister. 296 pp. Price $5.00. Illustrated. 1927.

Eleven authorities, many of them specialists in this field, have contributed to this volume. "Casein Plastics" is from the pen of Dr. Geo. H. Brother.

The Chemistry of the Natural and Synthetic Resins.

T. Hedley Barry, Alan A. Drummond and R. S. Morrell. 196 pp. Price $5.50. 1926.

The work of three English chemists, who are recognized authorities on this subject, one of vital interest to the Plastics Industries.

Celluloid.

Its raw material, manufacture, properties and uses.

Dr. Fr. Bockmann. 188 pages. 69 illustrations. $3.50.

In this book, the raw product, cellulose and its properties are thoroughly described. Other raw materials and methods of rendering them more plastic also receive attention.

Pyroxylin Enamels and Lacquers.

Samuel P. Wilson. 213 pages. Illustrated. $3.00

An authoritative work dealing with the materials and manufacture of pyroxylin solutions and with their application in the industry.

Synthetic Resins and their Plastics.

Carleton Ellis. 514 pages, illustrated. $8.00.

The book will serve as a guide and prove a stimulus to the numerous investigators and practitioners in the field of artificial resins. The section on plastic molding is an especially valuable feature.

Any of the above can be obtained by writing to

Book Department
PLASTICS
471 4th Ave., New York

Activities in the Industry

Important Statistics on Pyroxylin Plastics

MADE public April 18 by the Department of Commerce, the comparative figures for 1925 and 1923, covering the pyroxylin plastics industries should prove of much interest.

	1925	1923
Production total (lbs)	17,859,469	27,651,910
Value	$13,720,802	$17,682,049
For sale for fabrication (lbs.)	13,703,156	23,980.116
Consumed in factories (lbs.)	4,156,313	3,671,791
Finished articles made in pyroxylin factories, value	$10,984.254	$11,299,538
Other plastics, value	$9,870.012	$9,720.061

The last item covers, in order of importance, phenol resins, rubber substitutes and casein.

Farrell Veterans' Banquet

WITH Mr. Wm. Bowen as president, himself an employee of 55 years standing, Farrell Foundry & Machine Co.'s Veterans Association recently had its annual meeting and banquet, in the Masonic Temple at Ansonia, Conn. The Association numbers one hundred and sixteen members, each with more than 25 years' service to his credit thirty of them pensioners.

The toastmaster on this festive occasion was Mr. Charles F. Bliss president of the company, an organization which, as recounted in March *Plastics*, has a unique and interesting history.

Meyer Sues Viscoloid

Jos. H. Meyer Bros., assignors of the Higgins' Patents on the making of imitation mother-of-pearl (Pearloid) have filed suit against the Du Pont Viscoloid Co., for alleged infringement of Higgins' Patents 1,606,-030, 1,607,623 and 1,607,624. Suit was filed Feb. 15, 1927 in the District Court of Delaware.

New Trial Press

A small laboratory hydraulic press has recently been developed by Fred S. Carver, 90 West Street, New York, for small scale testing. With it, operating conditions for production on large presses can be worked out, and it is well adapted for production and experimental work on molding. Crushing tests, briquetting, embossing, drawing and forming operations, testing springs and the like are possible.

The press is entirely self-contained. The pressure is produced by a small hand pump operated by a lever and any pressure on the platens up to 20,000 pounds can be obtained. The platens measure 6″x6″ and the opening is adjustable from 0″ to 16″, with 7½″ between the columns. The platen has a drainage groove for use when pressing out liquids. Separate electrically heated plates to be attached to the platen for heating the material can be supplied when necessary.

The press occupies a space of 16½″ and is 36″ high. It weighs only 115 pounds, making it easy to move to various parts of a plant.

H J. WILLIAMS, a production chemist of many years' standing in the mid-west, has become associated with General Plastics, Inc., makers of Durez. He will act as Production Manager at North Tonawanda, New York.

THE Northern Industrial Chemical Company of Boston have bought up the Rawson Molding Company of Waltham, Mass., and the plant moved to the Northern Industrial plant at South Boston.

IN Chicago, the Schneider Electric Co. have increased their plant, taking over an adjacent building.

MOLDED PRODUCTS

Devoted to the purchase, further use and merchandising of all manner of molded parts

Vol. 1 JUNE, 1927 No. 2

The Age of Molding

II. Further instances of the successful replacement of metal

By A. Moses

RESISTANCE to acids and other chemicals, as well as to the ordinary moisture of humid atmosphere is well evidenced by some of the molded products notably those of the phenol resinoid type. A favorable comparison in distinction to metal is here apparent. Studs molded from phenol resinoid have often replaced those of metal because proof against the action of corrosive vapors. Additionally they serve to protect the bolts themselves. Hexagonal nuts, accurately threaded, and finished complete without the use of tap or threading die, have been molded for special applications.

Naturally, for switch plates and wiring devices in general, the fact that molded products are usually good insulators must constitute a point ofsuperiority when they are compared with metal. Then too, because of this fact their use is frequently conductive to simplification in construction. The full significance of this point is sometimes overlooked. Considering them from another angle, we shall find these materials generally non-conductors of heat, as well as non-inflammable, and therefore replacing metal for such parts as the heat regulator knobs on household gas ovens.

In quite another field, molded products are coming into their own—phenol resinoid material is replacing porcelain coated metal in the production of chair arms used on the apparatus of dentists and physicians; no doubt also on the well known barber shop chairs. When pressed from steel and enameled,

Molded Meadows' washing machine impeller: dashpot of Bakelite - graphite: subway strap-hanger.

Photos by courtesy Bakelite Corp.

these chair arms have always had a distinctive coldness to the touch. Moreover, their enamel has chipped off incessantly to the distress both of manufacturer and user. Such arms are now molded in one operation from one of the plastic materials which has properties of uniformity of construction, warmth to the touch, and permanence of finish, in addition to a half dozen other advantages. Another example is the molded strap-hanger.

Gas Mask Canisters

Another fertile field for the replacement of metal by composition products indifferent to chemical attack is offered by the canisters of gas masks. Many of the absorbing chemicals used to fill these containers will attack so corrosive-resisting a metal as aluminum, but have no effect on such materials as the synthetic resins, for example. To obviate the generation of fumes, which would vitiate the inhaled air, there should not be even a remote possibility of any chemical action between the absorbent filler and its container. Portability and practical upbreakability features essential for these appliances, are well cared for by lightness and resistance to shock.

Self-lubricating Bearings

Durability and accuracy are vital for bearings. Metals and anti-friction alloys, often specially compounded for this purpose, have for long held practical supremacy in this field. Now there may be a rival—the bear- molded from plastic composition. The possibility of molding a self-lubricating bearing by compounding a solid lubricant, such as graphite, with the bearing material, is certainly attractive. Dashpots for elevators, made of a synthetic resin-graphite composition, are examples of such an application.

Bearings molded from an oil-absorbent composition should also offer attractive possibilities. One such composition to be described later consists of wood pulp powder bonded together with silicic acid, and after molding, will absorb more than its own weight of oil.

On the previous page is depicted washing machine impeller molded in one operation from a phenol resin. It does not absorb liquids, does not corrode, and inflicts very little damage in use.

Viewing the situation as a whole, it will be realized that the replacement of metal parts by those of plastic composition will be gradual but sure. Metal will always have distinct functions, but its use will be in many cases conserved in the future wherever molded plastics prove infinitely better for the task in hand. In entering the field of metal replacement plastics have of course initially to contend with the fact that habit is frequently a hindrance as well as a guidance. For instance, three years ago many people said that the well known wall switch plates having always been made of metal, would of course never be made of anything else. In contrast to that thought we have the situation today where the use of molded switch plates promises to become quite universal.

The Future

The fullest realization of the possibilities of metal replacement by plastics in the general advance of mass production has not yet been realized. Increasing realization of the trend will develop as manufacturers of plastics study and announce the relative advantages and disadvantages involved in a great number of typical problems where replacement has been in question. The service of magazines dealing with the subject, will be rendered by the citation of specific examples of effective replacement—because specific evidence is valuable especially to the skeptic as a means for analysis and as a sound basis for conviction.

A Different Loud Speaker

DESCRIBED as a speaker designed on the natural principle of sound production, the Resonata loud speaker is an interesting example of the use of molded parts. Not only are the shell and foot molded in Bakelite, but the diaphragm itself is a molded product.

The latter consists of Bakelized linen made by impregnating a linen disk with the phenol resinoid and then hot-pressing the disk to the required conical form with its surrounding flat flare. Being only six thousandths of an inch thick, it is claimed to be readily responsive to all sound frequencies and its conposition renders it immune to change due to the weather.

Apart from the unique shape of the instrument and the utilization of resonance as distinct from sympathetic vibration for sound reproduction, the use of phenol resinoid molded parts offers the following advantages: Freedom from sympathetic vibrations occuring with metal; immunity from effects due to the weather; pleasing appearance.

Resonata was invented and developed through the combined efforts of Dr. Floyd S. Muckey, Lecturer on Acoustics of the Voice, Post Graduate Hospital Medical School, and Henry G. Opdycke.

Their patents are owned by the Resonata Corp. of America. The Boonton Molding Co. mold and shells and the Diamond State Fibre Co., Bridgeport, Pa., make the disks.

Shall We Mold Our Own?

By A. E. Buttner
Gen. Mgr. Electrical Specialty Co., San Francisco

THIS is the heyday of the specialist. Modern industry with its highly complex structure, its relentless movement towards quantity production has called him forth. The field of molded products is no exception; in it the Custom Molder has a real part to play, well-defined, and to all intents, indispensable.

The question, "Shall we mold our own phenol resin and other plastic parts" frequently crops up among users of molded parts. In an attempt to supply the answer, the writer relies on his observations made during the last few years in the territory which our business covers on the Pacific Coast.

It has been our contention all along that molding should really be done by what the writer would be pleased to call "professional molders"; that is to say "custom molders". There are a number of these on the Coast, several being very large organizations able to care for almost anything in the molding line, and fully competent to furnish any dies necessary in the molding industry.

Deterrent Factors

There are a number of factors to deter the user of molded parts from doing his own molding. First of all he must invest in equipment which, in the case of a large user, amounts to a considerable inital outlay of capital. Then, to do the work properly he must employ a supervisor thoroughly familiar with the molding work, and such men are hard to find. Lastly, he must be prepared to design and make his own molds, and it is in this respect that his inexperience is likely to be most costly.

Of course there will be cases where the policy of the user would dictate that he do his own molding, so that the matter of delivery and service will be within his own control; if either fail, he can blame only himself. He may also wish to have readily available facilities for doing his own experimental work on new molded pieces.

WORKING on the new section **Molded Products** *has naturally brought us in closer contact with our friends the custom molders. Several times we have been asked to state our position on the rather important problem of "Shall We Do Our Own Molding."*

It might be well to state here that **Plastics** *holds no so-called position on this subject.*

Obviously, any opinion we might voice would give an opportunity to some people to take the stand that that opinion was based primarily on our own interest in the matter. **Molded Products** *is supported entirely by the advertising of the custom molders. We consider our primary duty to our readers first, and our editorial attitude must remain entirely unbiased regardless of whether our interests are affected or not.*

Advice, we are glad to give and will always render this service to our readers from an independent angle. Should we be asked our candid opinion on this question, we should say "Let Every Man Stick to His Own Last." Manufacturing a particular article is one question, while molding a part for it represents a distinctly different phase. Molding today is represented by an independent industry, and only the years of experience, the efficient equipment and volume production of the custom molder can produce the excellent work and the low prices which prevail. **Plastics** *can draw this analogy even closer to itself. We are publishers and lend our entire efforts toward making our publication better each month; we do not attempt, however, to do our own printing, leaving this most important detail to one who knows more about it than we do.*

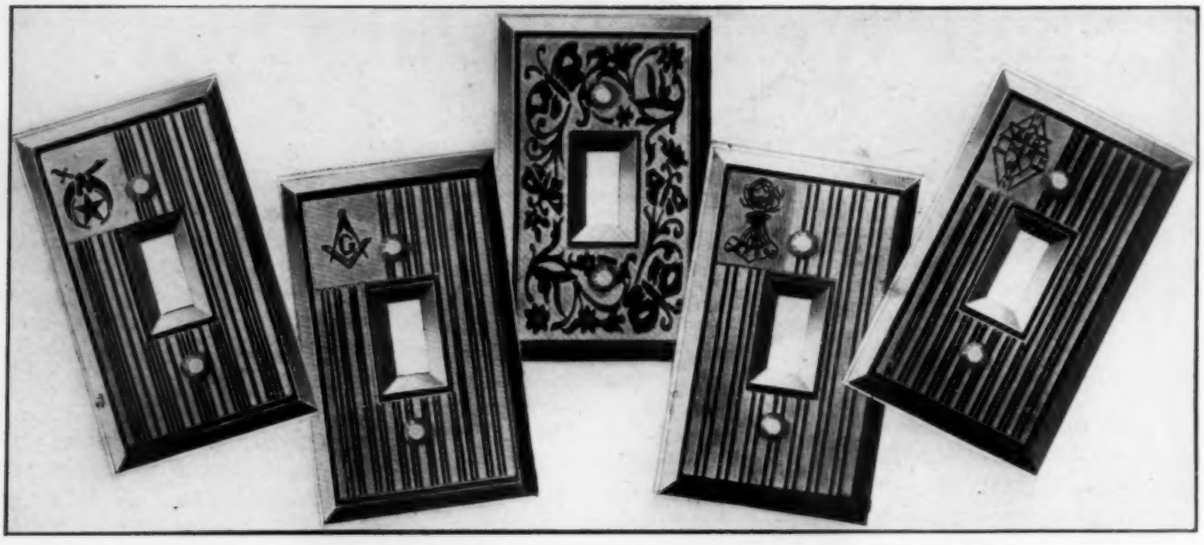
Experience Essential

Coming to the question of experience in molding technique. This is most essential, not only so that the user may get his parts properly made but also so as to utilize to the full specific qualities of the composition.

Without the requisite technique, the parts will not come up to standard, and there will be much waste of material, time and energy. Depreciation of presses and equipment will follow also.

Because he is a specialist in his own line, the custom molder is a logical development in the industry. Not only can he turn out the work to his patron's specific requirements, but he is of necessity in a position to give advice as to the most sensible and economical procedure. This applies also to the construction of the dies.

With these considerations in mind, we have discouraged users from doing their own molding whenever we could. Of course, there have been exceptional cases of organizations that have insisted upon establishing their own molding department. Such concerns would not care to use a molded part in their own product, if they were dependent upon an outside source of supply. Often-times their specifications as to dimensions and general quality are so severe that the work would not be attractive to the molding business. For these, a "mold your own" policy may be a worth-while investment, though costing much more than dealing with a custom molder.



Molded switch plates bearing the emblem of the Shriner, Masonic, Elks, and Knights of Columbus Orders.

Emblem Switch Plates--a New Departure

The emblem switch plate molded in Bakelite is the newest addition to this line of molded products, already noted for its variety and complexity. Plates thus distinguished, should meet with a vigorous demand in view of the number of buildings being erected to house fraternal organizations. It was this idea that actuated the innovation, as well as the desire to feature something different in so intensely competitive a field. The makers are the Connecticut Electric Mfg. Co., Bridgeport, Connecticut.

In addition to the four fraternal emblems shown in the illustration, there are a number of stock designs similar to that illustrated. Besides these standard designs, any pattern can be reproduced. There is also a special order custom-made plate, a line for which there appears to be a considerable demand. Plates inscribed with initials should be a favorite field for this line.

Thus far, orders for the latter, have called for plates of special color and combination plates of two or more gangs combining the usual devices in one box. There are also standard plates and standard combinations but made up in special sizes of oversize plates.

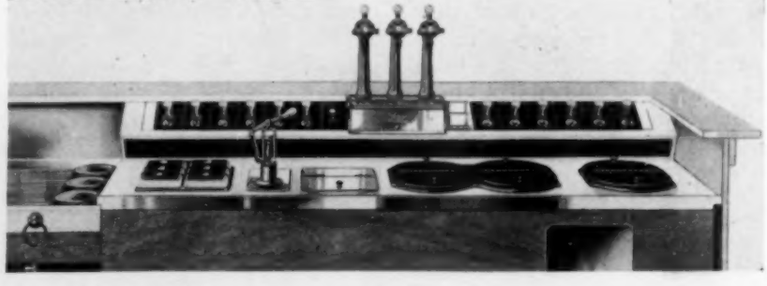
As these custom-made plates have only recently been introduced, there have as yet, been no requests for odd designs, but what this development may ultimately bring it would be difficult to phophesy. In this connection there comes to mind the emblematic needs of the colleges and Greek letter fraternities. In fact, the fraternity and college pennants may find their usefulness considerably increased by these emblematic electrical fittings.

Soda Fountain Developments

MOLDED parts for soda fountains and similar fittings are becoming increasingly popular, a trend not surprising in view of the unique properties of molded phenol resins. Their chief point of superiority over metal parts lies in their insulating properties. Because they are non-absorbent, such molded parts are equal to similar parts in sanitary qualities, while their permanent polish, elegant appearance, and reistance to attack by fruit acids, are points in favor of the former.

One soda fountain manufacturer—Grauman Soda Fountain Works, Los Angeles—has been developing some rather unusual effects with parts and panels molded from well-known phenol resin composition. Molded covers and breaker-strips for the

(*Continued on page 308*)



Molded fittings on a mechanically refrigerated fountain.

TIME WILL TELL

THE true test of the moulded part is not only its appearance as it leaves the moulder's press, but the way each piece endures the wear, stress and purpose for which it was made. This only "time will tell."

Scranton parts are made of Phenolic, Bakelite or Laconite in the largest plant of its kind in the world; backed by one of the oldest and the largest organizations in the country.

The Scranton Button Co.'s customers know the satisfaction and confidence of working with Scranton engineers.

The Scranton Button Co.

SCRANTON, PA.

Western Representative, Gordon D. Wilson
645 Washington Boul., Chicago, Ill.

New York Office, 50 Union Square
Arthur Wiseburn, Manager

Ohio Representative, J. E. Black & Co.
The 4900 Euclid Bldg., Cleveland, Ohio

Distinguishing Molded Parts

Simple tests presented in a form both useful and handy for reference.

By W. F. Lent

Asst. Supt. Cutler-Hammer Mfg. Co.

IT frequently becomes necessary to identify the material of which a sample of molded product of unknown manufacture is made. In mere appearance a number of composition products are so similar that further qualifying tests are necessary, particularly for the uninitiated.

Some plastic products may be fabricated by molding the suitably prepared material in a mold having the required shape, and others by machining the material from sheet, rod, or tube by sawing, drilling, punching, turning etc. It is generally easy to determine whether the parts have been molded or machined by observing the presence of fins, ejector marks, and the character of the surface of molded parts on the one hand; and on the other hand the tool marks of machined products.

The following table, covering the most important plastics, gives simple tests which may be conducted without the use of special apparatus. Frequently the material may be fixed by those tests which do not destroy or mar the sample seriously. In other cases destruction or damage by heat is necessary. The expert familiar with fine distinctions is able to easily fix the material without destruction. The complete set of tests will however aid the uninitiated materially.

It should be understood that the properties of any one class cover a wide range according to the fabrication details, and the proportions and character of the ingredients. Considerable latitude in these tests may therefore be expected.

Name of Product	Color	Appearance when unpolished.	Mark paper	When cut with sharp knife	Match flame	Remarks
Molded						
Shellac or "Button Stock"	Black, Brown, Red, or Strong colors.	Lustrous smooth	Like soft pencil	Easily, crumbles	Softens with resinous odor	Will soften in hot water
Condensation Products	Black, Brown, Red, or fairly strong colors.	Lustrous smooth	Scarcely marks	Hard, crumbles	Will not soften but chars. Phenol or ammonical odor.	Unaffected by most acids and solvents
Cold Molded, Organic	Black, Brown, Red, or strong colors.	Fairly smooth	Faint mark	Hard, crumbles	Will not soften or char	Will not support combustion after 1 min. in Bunsen burner
Cold Molded, Inorganic	Grayish White	Fairly smooth	No mark	Hard, crumbles	Unaffected	Fairly water absorbent unless treated (brown colored when impregnated)
Hard Rubber	Black (brownish when aged).	Fairly smooth	No mark	Hard, shaves	Softens with burning rubber odor	Surface oxidises slowly turns brownish
Pyroxylin	Practically any color.	Lustrous smooth	No mark	Very easily, Shaves	Ignites and burns rapidly with camphor odor	Softens in hot water. Camphor odor when rubbed
Machined						
Fibre	Black, gray, red, or brown	Rather porous Surface	No mark	Fairly easily, Shaves	Chars, burning paper odor	Somewhat hygroscopic, swells when soaked in water
Laminated Condensation Products.	Black, red or brown	Dense smooth	No mark	Hard, shaves	Chars, burning paper odor	Moisture proof
Pyroxylin	Practically any color	Smooth	No mark	Very easily, Shaves	Ignites and burns rapidly, camphor odor	Camphor odor when rubbed. Softens in hot water
Casein	Practically any color	Smooth	No mark	Hard, crumbles shaves when warm	Chars and slightly softens, burning wool odor	Somewhat hygroscopic, swells when soaked in water

Beat Competition-- Chicago-Bakelite Will Help You

Competition is keen in all lines of manufacturing. Old established firms find new products making inroads on their sales. New ideas—new methods—new principles are causing many of the old timers to have restless, sleepless nights. The rapid growth of the Chicago Molded Products Co. is the direct result of our ability to aid others—for as our customers succeed—so do we. We have shown many manufacturers how Chicago-Bakelite will reduce manufacturing costs—and we would like to show you, too.

Our Engineering Department Is At Your Service

It is our earnest desire to serve you in every respect by helping to solve your engineering problems. This company is managed by men, who without doubt have had the longest and most experience of any custom moulder in the field.

We will be glad to assist you in planning and redesigning your parts to make them a practical and efficient moulding job. Our service and research to you is free of charge, and we make a special effort to do this.

Tool & Die Department

Our long experience in building Bakelite moulds for others, also dies and tools, careful attention to details, specific accuracies, scientific heat-treating, polishing to mirror finish insures the finest quality moulded parts. Our modern precision machinery insures immediate service.

Largest Bakelite Moulders in Chicago

This plant has grown from a small concern to a commanding position among the leaders today. We are known for doing Big things in a Big way for a prospective buyer, who is planning to place his business with a concern who is reliable and capable of carrying a contract through to completion. We are continually increasing our plant, and today we have one of the largest, most modern, and best-equipped factories in the west, that is run by high-pressure steam, which is the ideal heat for this work.

Write Us For Prices

Your inquiries will receive immediate attention. Day and night service in moulding department insures highest quality and volume production at most reasonable prices. Just send us a sample, print or specifications of what you desire. Quotations will be sent you by return mail.

Judge Us by the Manufacturers We Serve

"Know a man by his associates" is an adage of long standing. This is just as true of Business associates. Below we give a few of the manufacturers we have served either in our Bakelite or Die and Tool Departments. WE CAN HELP YOU TOO!

WESTERN ELECTRIC CO.
AUTOMATIC ELECTRIC CO.
STEWART DIE CASTING CO.
WILLIAMS BROS. AIRCRAFT CO.
JOHNSON SERVICE CO.
LORRAINE CORPORATION.
MEADOWS MANUFACTURING CO.
ZENITH RADIO CORP.
REICHMANN COMPANY.
YAXLEY MFG. CO.
ELEC. HOUSEHOLD UTIL. CORP.
SIMMONS BED COMPANY.
ADDRESSOGRAPH COMPANY.
AMERICAN CAN COMPANY.
CONLON CORPORATION.
TOKHEIM OIL TANK & PUMP CO.
MANTLE LAMP CO. OF AMERICA.
CAMERONS SURGICAL SPEC. CO.

Chicago Moulded Products Corporation

Subsidiary to

Plymouth Manufacturing Company

2150 W. Walnut Street **CHICAGO, ILL.**

RODS
TUBING
NOVELTIES

CREATED *of* PYROXYLIN

THIS company has had fifty years of thorough experience in the production of these items. Our engineers are equipped to solve your problems in the pyroxylin plastic field by reason of their knowledge of old methods and new developments.

UMBRELLA RODS

A Specialty

Prompt and Expert Attention Given Your Inquiries

Rubber & Celluloid Products Co.

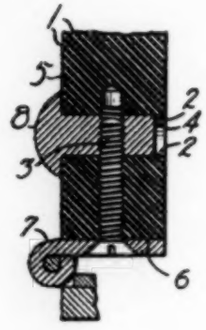
PLANT 2

411 Wilson Ave. Newark, N. J.

Fitting Hinges

It is old in the art to employ metallic inserts molded into electrical insulating material for the purpose of providing screw threads of greater strength than that of the material within which the metal is inserted.

In U. S. Patent 1,624,595, dated April 12, 1927, issued to Arthur Haddock and assigned to the Western Electric Company, means are described for securely fastening a hinge, for example, by means of screws to the *edge* of a panel of insulating material.



As shown in the illustration, a metallic plug (4) is inserted in a hole (2) drilled in the panel, and another hole is then drilled lengthwise into the edge of the panel, threads being tapped into and through the plug (4) as plainly shown.

It will be obvious that not only will the screw (3) be held by means of a metallic thread in the plug (4), but the force exerted by the former will be distributed over a larger portion of the insulating material by this means.

A tapped hole between the edge of the panel (6) and the plug (4) is not essential, as a clearance hole may suffice, although the method described will provide a more rigid attachment.

"Ordering On Confidence"
in July Molded Products

Starite--A Versatile Plastic

This, a comparatively newcomer in the actively growing list of molding compositions, appears to be endowed with many unique and diversified properties, according to the manufacturers. To begin with, it is non-inflammable, flexible and comes in a variety of natural effects and colors, including white.

Translucent and transparent forms are possible, and what is more, very thin pliable films can be made, equal in brilliancy to those of cellulose nitrate and acetate.

As it is antiseptic and resistant to water and many chemicals, it should make excellent telephone mouthpieces, receivers, medical and surgical instrument parts. Battery acid is without any appreciable attack, so that transparent battery boxes should be possible.

An outstanding claim is that it is resilient after molding, and our illustration of part of a molded diaphragm substantiates this.

Results of Tests

Appended are some data culled from the Electrical Testing Laboratories, New York.

DIELECTRIC STRENGTH

(volts per mill)

Dielectric strength	Thickness mm.	Samples tested.
295-335	217-230	6

The voltage at puncture varied between 64,000 and 77,000.

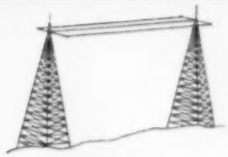
TENSILE STRENGTH

(Lbs. per sq. inch)

Samples tested	Area Sq. inch	Tensile strength
3	0.213-0.223	3400-3850

Pieces tested were 3/16 inch thick.

Evidence of the flexibility of a Starite sound-box diaphram.

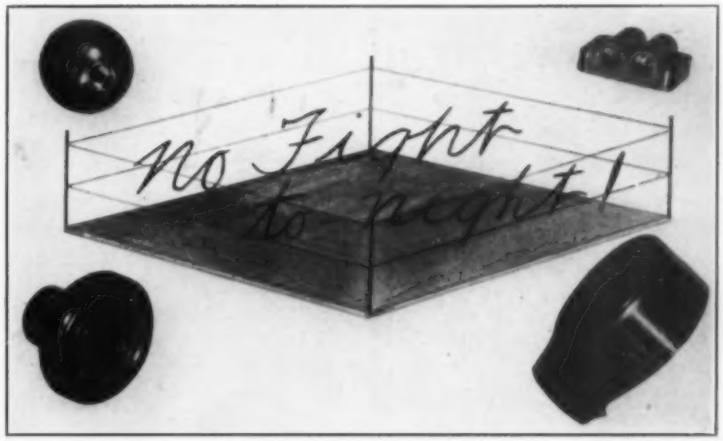


Owners
of W. M. A. K.
The Broadcast System
of the Niagara Frontier

RMA MEMBER RADIO MANUFACTURERS ASSOCIATION

NORTON

Moulders of Plastics



Called off because Mr. Buyer found no fight was necessary in order to get service and quality from Norton.

Service, not the elastic kind that stretches and doesn't meet, but the kind resulting from an organization that is on their toes when you ring the gong.

Quality, not the kind that is so much talked about, but genuine at the minimum cost.

Norton Laboratories, Inc.

1025 Mill St. **Lockport, N. Y.**

Tear off, sign, and mail address

Date .....

Norton Laboratories, Inc.
1025 Mill St., Lockport, N. Y.

Gentlemen:

You may send me a sample souvenir of your plastic molding work. We are interested in learning what you can do for us to help lower our costs or improve our products by utilizing your plastic moulding facilities and personnel.

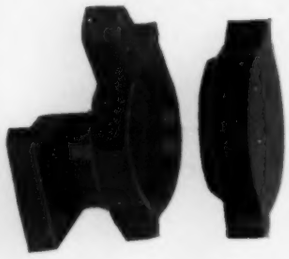
Name of Company .....

To whom .....

Address .....

SOUVENIR—ARTISTIC LETTER OPENER

For
That small Job.
That
Job of a limited Production,
That
Mould of Prohibited Cost,
That
Intricate Mould,



With
Our Equipment
With
Every one a producer
With
Overhead cost cut to The Lowest Notch.
With
Seven Years of Specialization
We
Can give you Service
We
Can give you Figures that are satisfactory.
Get
Our quotations
Send
Blue print, sketch or sample
To

Keystone Specialty Co.
LAKEWOOD, OHIO
Specialists

Plastic Moulding
From
Bakelite or other Material to suit you.

Looking Back

By V. C. Rockhill

THE manufacture of molded products is an industry which, although established in this country more than sixty years ago, is as yet little known outside of a narrow circle. This narrow field embraces a comparatively few buyers out of the potential thousands who should be buying molded plastics for one purpose or another.

Yes! Plastic molding must certainly be termed an art, when one stops to consider the qualifications essential for success. First come the specialized knowledge and engineering skill needed for the successful designing of the molded articles; second, the designing of the molds, often erroneously called dies, needed to mold the desired article properly, frequently to an accuracy of a single thousandth of an inch; next, the special presses that must frequently be designed and built to mold to fine dimensions for quantity production; and last, but by no means least, the knowledge gained only through long experience as to the qualities plastic compositions should have to bring about a desired result.

The molding of plastic composition in the United States goes back to about 1875, when Timothy Woodruff, Peter Sylvester and John Nailor first started to mold shellac composition—for a long time referred to as "button" composition—at Auburn, N. Y. This was several years after the perfection of celluloid, however.

One of the earliest shellac records, date Feb., 1896.

Then, as the so called "old line" molders became somewhat better acquainted with their own product, they started to branch out into molding for trades other than the button trade, such as the molding of poker chips, scores of millions of which were sold annually. A single order calling for the molding of four or five million poker chips was not considered unusual twenty-five years ago. Molded checkers, albeit of course in far smaller quantities, were a natural corollary to poker chips. Then came pipe stems, and fountain syringe parts along with articles of a rather more ornamental nature, such as photograph frames, inkwells and ink stands, boxes for face and tooth powders, containers for sewing sets, soap dishes, photo developing trays, etc. But the molder then as now, although to a greater extent in those days, was obliged to cast about continually for new uses for his products.

Entering Electrical Field

Then came the venture into the mechanical field or rather the musical: molded piano keys, violin and banjo keys, piano panels, violin chin rests, etc.

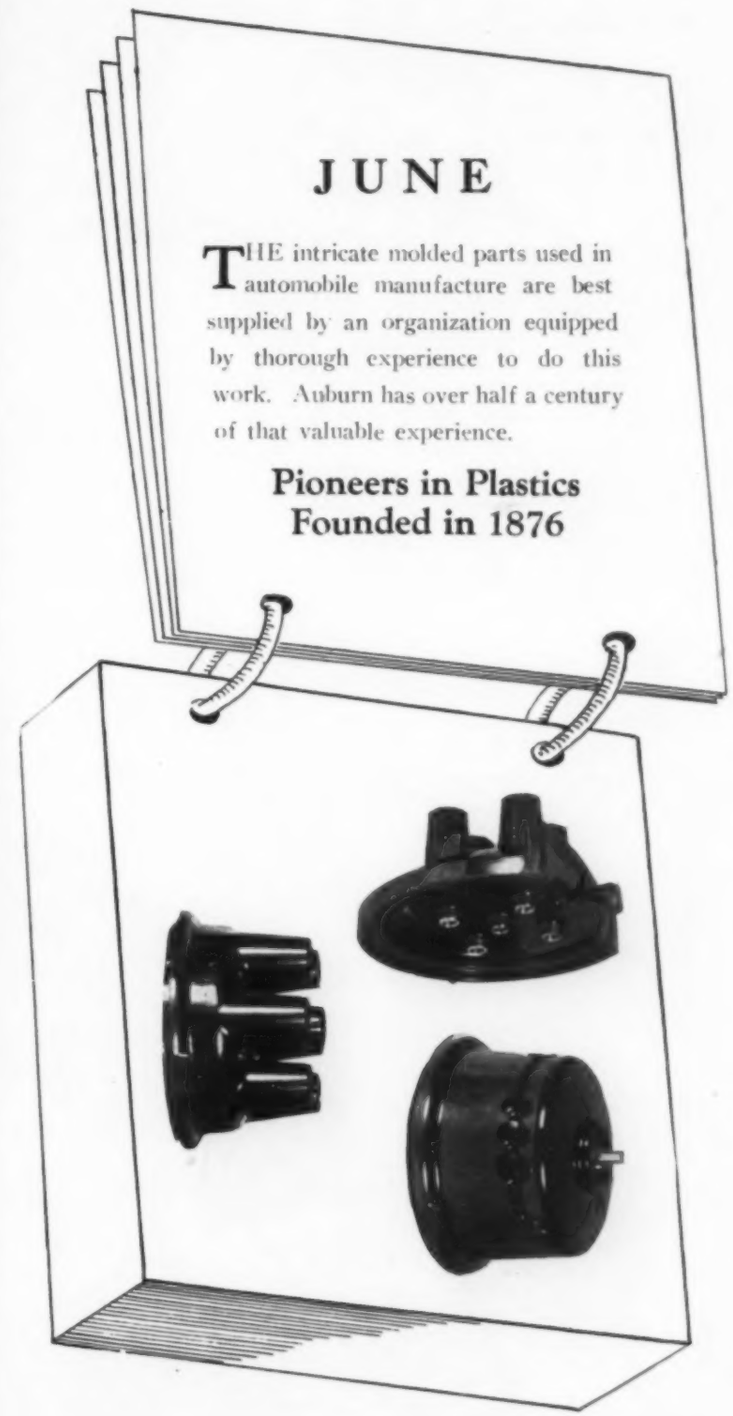
About this time also, the shellac molders in fear and trembling, began to touch the field which to-day is the greatest consumer of plastics—the electrical field. The old molders started with molded electric lamp socket keys and lamp socket bushings, and despite all later developments, those two items are molded to-day of shellac composition into the hundred of millions annually. Quickly followed battery jar covers, bases and strips of all kinds, telephone mouthpieces, receiver shells, etc.

Shellac soap dish with cloisonne silver inlay (1898). Shellac telephone receiver shell with reinforcing metal lining (1910). Advertising chips of shellac (1892).

Then, when in the early '90's Mr. Emile Berliner made the phonograph commercially possible through his invention of the sound box. there was developed by Messrs. Steinberger and J. Rockhill, the flat disc phonograph record of shellac composition. And despite all the later improvements in molded plastics, no composition has yet been developed to supplant shellac composition for phonograph records. Since the close of the Great War we have molded more than one billion phonograph records in this country, and yet the molding of plastics is an industry almost unknown outside of a narrow circle.

It is difficult to believe that although by 1918 over $5,000,000 was invested in molding establishments with an output valued over $25,000,000, per annum, the Clasification Committee of the Inter-State Commerce Commission had not even given plastics a freight tariff rating. And it was only after a committee of plastic composition molders had been appointed through the instrumentality of the Associated Manufacturers of Electrical Supplies (now the National Electrical Manufacturers Association), and had made repeated appeals to the Railroad Tariff Commission, that the molding industry received official recognition and a freight rating.

Let us step back almost twenty years. I have before me a letter to my father which reads "I am about to go to Niagara Falls, and send you advance copy of


JUNE
THE intricate molded parts used in automobile manufacture are best supplied by an organization equipped by thorough experience to do this work. Auburn has over half a century of that valuable experience.
Pioneers in Plastics
Founded in 1876
Auburn Button Works
Auburn, N. Y.

The VITAL FACTOR
in PLASTIC
MOULDING
Is
The Mould

KJMTCo

WE MAKE Our Moulds

And we know how to build moulds! We've been building them for the Bakelite, Rubber and Porcelain Moulding Industries for years. And now you can receive the benefit of this experience with the natural saving in cost by ordering your moulded parts direct from us.

A request for information will prove highly interesting.

KUHN & JACOB MACHINE & TOOL CO.
Moulding Division
501-2 Prospect St. TRENTON, N.JJ.

Moulded Hard Wood

Especially adapted for moulding into handles for Irons or electrical appliances.

BRAYLITE

We will gladly figure on special objects from Braylite to replace wood where quantities are large enough to justify moulds.

BRAYLITE MOULDING CORP.
109 Hudson St.
Jersey City, New Jersey

an article which I am going to read there—on a material which I call "Bakelite"—and that letter is signed (Dr.) Leo H. Baekeland.

Bakelite—a molder's composition—a plastic—a synthetic material—the first of its kind in this country—is still a novelty to many buyers in a variety of fields. Introduced in a dry granular or powdered state or as preformed tablets or pellets into a hot mold, this and certain similar synthetic compositions which have come into some prominence recently, become solid homogeneous masses at 325 to 400° F, taking almost any shape or form or size, thick or thin, at the option of the molder.

In conclusion, as a molding process is essentially one of great simplicity, it lends itself well to quantity production. Further, the versatility of many molding compositions is such that they can often economically replace many more costly materials. It is the combination of these two factors that augurs so brightly for the future of the molded products' industry, one to which new avenues of progress open up almost daily.

Amerith Exhibit

One of the most interesting features of the exhibit of industrial products manufactured in Newark, N. J., now being conducted by the Kresge Department Store of that city, is an attractive display of Amerith sheets, rods, tubes, novelties, specialties and vanity articles. This display, arranged by The Celluloid Company, one of the leaders among Newark manufacturers, has been given a prominent position and is laid out very artistically. A series of semi-finished parts demonstrating the progressive steps in fabrication of vanity articles and a chart explaining the manufacture of Amerith from from raw materials to finished products, lend an educational value to the display. The exhibit will continue until June 18 and a representative of The Celluloid Company will be in charge of the Amerith booth to answer questions.

Another Bakelite Promotion Display

BEGINNING June 1st, and continuing for several weeks, there will be on display at the Architects' Building, Park Ave., and 40th St., New York, a novel window exhibition. It will be arranged to show various typical applications of Bakelite products in the home. The window will be designed to represent a section of a Living Room. To the rear of the window an entry with conventional type of door will be utilized to show a Bakelite knob and escutcheon plate. Near the casement a wall switch plate will have place, and the baseboard will show a typical electrical outlet fitting. A small writing desk will show the use of Bakelite Laminated stock to provide a smooth lustrous surface which is unaffected by ink, or perspiration.

"Domes of Silence," small convex-sliders, will be indicated as the Bakelite quota of a chair, while an Atwater-Kent radio set will typify the use of Bakelite for radio. The ceiling lighting fixture is a six piece molded Bakelite unit, of the type installed throughout the offices of the Graybar Electric Company, in the new building bearing their name. A desk set, consisting of blotter holder, letter opener, and ink stand, will represent the the transparent variety of Bakelite resinoid.

This window feature is in a way supplementary to a comprehensive permanent display which the Bakelite Corporation maintains in the showrooms of the Architects Samples Corporation, Architects' Building.

Here are displayed numerous electrical fittings and switch plates, very varied in complexity and color, including bright green and cream. Among other products are toilet seats and a number of samples of the laminated products in wood and marble finishes.

JEWEL ELECTRIC INST. CO.

PARTS MOULDED OF BAKELITE

by SCHNEIDER

The intricacies of these Jewel Electric molded parts and the exact perfection of their details are fair ideas of what to expect when ordering your molded parts from

SCHNEIDER ELEC. & MFG. CO.

312 N. Sheldon St., CHICAGO, ILL.

Trade Moulding Exclusively

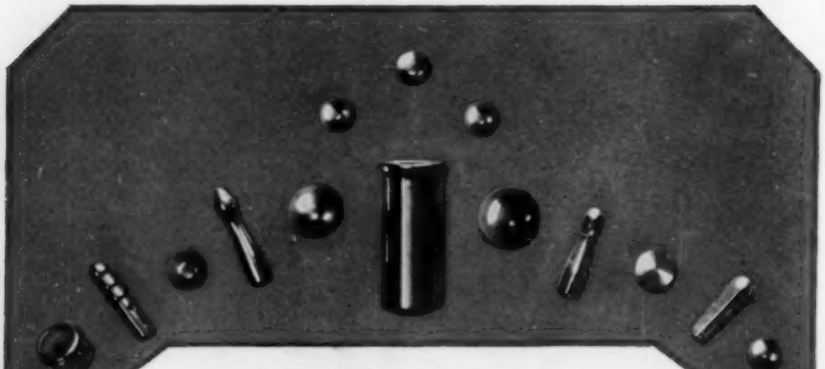
Modern Methods, Plus Quality,
Service and Price of Custom
Molding, for All Industries

IN LARGE QUANTITY

MODERN MOLDED PRODUCTS CO. INC.

BLOUNT AND ELM STS.
PROVIDENCE, R. I.

Send us Drawing, Blue Print or
Model and Let Us Work with you
to solve your Molding Problem.



Expert Turners of
Celluloid Beads—Buttons—Handles
—Knobs, Etc.
from 100/1000 thickness up to 1 inch
Guaranteed accurate up to 3/1000 of an inch
Our last year's Umbrella Tip production alone exceeded 300,000 gross
We solicit inquiries on quantity items

George Morrell, Inc.
104 5th Ave. New York City
Factories. Leominster, Mass.

In Germany

It is always interesting to get a foreign slant on any subject, and a recent conversation with a director of a prominent German molding company afforded an opportunity.

His information of Germany coincided with our own experience in this country—there is a big field for molded products waiting. An interesting point was the vogue of cold molding in phenol resin compositions, a development almost unknown here. In fact, the major part of his company's business was in this line.

Among European developments in molded products, mention was made of brush collector bolts, and multiple phase switch bases. Making the former of mica is a difficult job, while slate, the material for the latter is fragile. Other developments are tumbler switches, surgical shields, shoe heels, and portable typewriter parts.

Bincolite, a new resorcinol trioxymethylene resin sponsored by the German General Electric Company, is reputed to be stronger than many other phenol resins, and to mold very quickly at the low temperature of 130 to 140° C. Another composition of the same type is Novoresit made by the firm of August Nowark. Much progress has been made in Germany on the standardization of molding compositions, and further information on this important subject is awaited with very keen interest.

Silent Fans

The laminated phenol resin product Micarta has recently found a novel application in the construction of fan blades. Having no natural period of vibration, blades thus constructed can be given a more pronounced pitch than those made of metal, thus enabling the fan to be run at a slower speed to produce an air stream of similar velocity.

Automobile Door Handles

DOOR handles for automobiles are at present made almost entirely of molded material. In some cases pyroxylin plastics are employed but regularly molded handles with the necessary metallic inserts and parts have many advantages in manufacture.

A recent patent, U. S. P. 1,626,278; April 26, 1927, to Joseph Goodman assignor to Mt. Carmel Mfg. Co., describes a method for using a material like hard rubber.

The invention relates to handles and particularly to handles of the type used for automobile doors, although it is, of course, not limited thereto but may be used for making similar handles, and it has for an object to provide an improved method of mounting in these handles an insert of a contrasting color to the color of the body of the handle to give a neat and attractive appearance, and also in some instances to strengthen the handle and assist in the securing together of the parts comprising the handle.

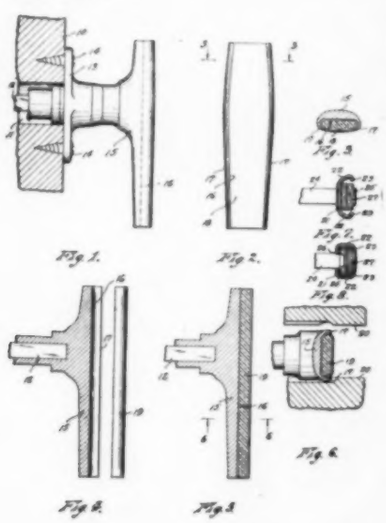


Fig. 1 is a side elevation of a handle complete secured to a door.

Fig. 2 is a front elevation thereof.

Fig. 3 is a transverse section substantially on line 3—3 of Fig. 2.

Our factory of modern fire-proof construction, ensures you the constant, dependable source of supply.

BAKELITE MOLDING

Our experiences—as one of the Pioneer Molders of Bakelite—have given us an unusually broad knowledge of the problems confronting its use.

This knowledge has helped us to be of real service to hundreds of manufacturers using Bakelite in their products.

CUSTOM MOLDING OF EVERY DESCRIPTION

The illustration on the left, shows a corner of our ample assembly room.

The photograph below, illustrates the unusual amount of daylight in which our employees work.

Our engineering department is made up of some of the best informed experts in the use of Bakelite. It has been of invaluable service to manufacturers who use, or have contemplated using, Bakelite, in their products.

This department is at your service—gratis—put your problems up to these men — they can probably help you, too.

If you are interested in the highest quality of workmanship —in prompt deliveries and moderate prices, let's talk it over. We will be glad to tell you more of how we can be of service to you.

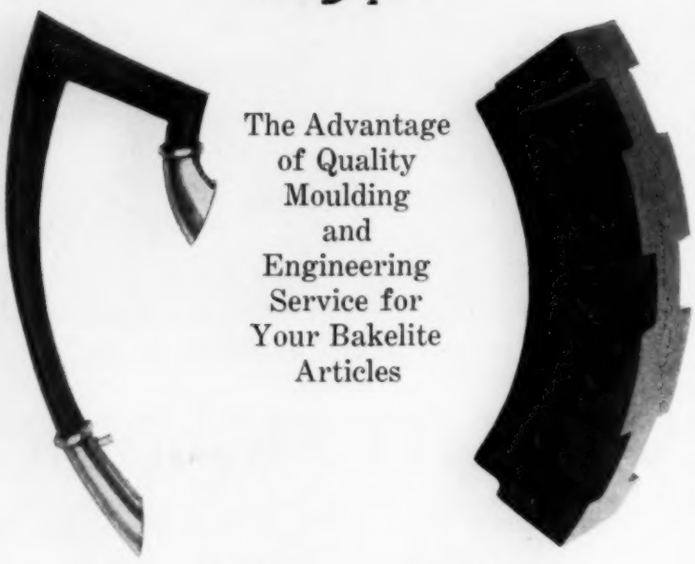
Pioneer Moulders of Bakelite

Northern Industrial Chemical Co.

Established 1908

11 Elkins Street **BOSTON, MASS.**

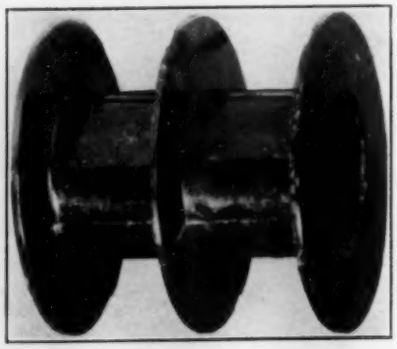
TRADE DM MARK



The Advantage of Quality Moulding and Engineering Service for Your Bakelite Articles

Diemoulding Production Co.
Incorporated
Trade Moulders of Bakelite Materials
CANASTOTA, N. Y.

CUSTOM MOLDERS
of
BAKELITE
and
Canvass Reinforced Bakelite



Molded products as tough as laminated parts insuring durable shock resistant pieces eliminating high machining and assembly costs.

MACK MOLDING CO., Inc.
Little Falls, N. J.

Fig. 4 is a longitudinal section through the handle body with the insert separated therefrom.

Fig. 5 is a similar view showing the insert placed in the body of the handle.

Fig 6 is a transverse section substantially on line 6—6 of Fig. 5 and indicating the method of securing the insert in the handle.

Fig. 7 is a transverse section similar to Fig. 6 of a slightly different construction of handle with the insert ready for securing in position, and

Fig. 8 is a transverse section of the construction shown in Fig. 7 completed.

The handle is secured to the door by an escutcheon plate 13 through the screws 14, and the spindle 12 extends through this escutcheon and is rotatable therein in the usual manner. This spindle is connected at its outer end to the operating handle which comprises a metal body member 15 having a longitudinal groove or channel 16 in its front face forming side flanges 17. When the metal body member is formed these flanges are substantially at right angles to the body as shown in Fig. 6 or flared outwardly as shown in Fig. 7, to allow for placing of the insert 18 in the groove or channel between the flanges. The ordinary method of mounting this insert is to fill the channel in a mold with the plastic material or powdered material and vulcanizing it in the mold with the action of heat and pressure, but the present improved method for placing the insert in the handle is much less expensive and may be formed more easily and rapidly with less apparatus.

The Method.

In carrying out the invention, a slab or a strip 19 of the material is provided which contains approximately the amount or a somewhat greater amount than is required to fill the groove in the handle when completed, this slab being somewhat the shape shown in Figs. 4, 5 and 6 and made of a material which is hard at ordinary temperatures but is relatively soft or plastic when heated, such for

instance as hard rubber. The slab is placed in the channel between the flanges 17 as shown in Fig. 6 when the hard material is heated and therefore, is in a relatively soft or plastic condition. The flanges 17 are then pressed inwardly into the side edges of the slab by any suitable means, such as the dies 20 of a power press, to substantially the position shown in Fig. 3 so that their free edges overhang the inner side edges of the slab and are also pressed into this slab as it is relatively soft and plastic. This pressing of the flanges against the sides of the slab causes the plastic material to completely fill the groove and it is then allowed to harden by cooling, after which it is substantially in one piece with the metal bar. Any surplus material may be removed and the surface finished by grinding and polishing.

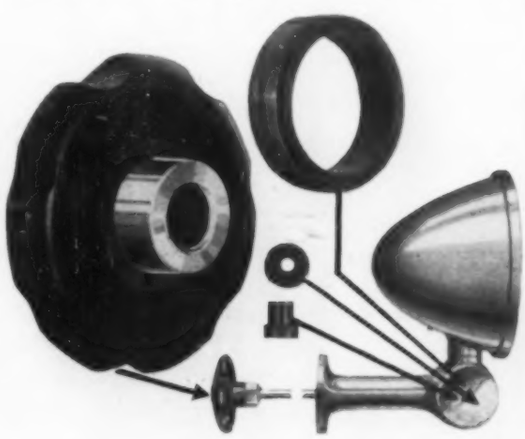
A Different Procedure

In Figs. 7 and 8 is shown a slightly different construction in which the insert is mounted in exactly the same way. In this construction the cross bar of the handle comprises a sheet metal channel member 21 with the free edges of the side members 22 providing inturned flanges 23, the channel member being secured to the latch operating spindle 24 by means of a metal bar 25 rigidly secured to the end of the spindle as by riveting it thereto, the spindle passing through an opening 26 in the channel member. When it is first formed the cross section of the channel member is substantially that shown in Fig. 7. The insert slab 27 is placed in this channel in the heated and relatively soft and plastic condition, the sides are then pressed inwardly to the position shown in Fig. 8, firmly gripping the slab, forcing it to fill all the spaces within the channel member, and the embedding the side flanges 23 in the sides of the slab as shown. The insert is then allowed to harden by cooling the same as in the first form, and may be finished by grinding and polishing. In this

ALLEN & HILLS
Incorporated
Moulders of
SYNTHETIC AND NATURAL THERMOLPLASTIC MATERIALS
For Precision Production we offer a new plant equipped with new machinery operated by an experienced technical staff.
A quotation from us will prove interesting.
A trial of our work will be convincing
ALLEN & HILLS, Inc.
AUBURN, N. Y.

Walnut Bakelite Handle with Threaded Nickel Insert—Brass Collar Molded in Bakelite Ring to insulate and form a press fit—Bushings are also a press fit in a drilled hole.

Molds Were Made and Production Started In Three Weeks



THE RECTO MANUFACTURING CO.
23 W. Third St. Cincinnati, Ohio
Molders of Bakelite

Have you investigated?

THE extensive use of molded products is a comparatively new development. In fact, it is so new that it may not have occurred to you to use such a part in place of some article that might be made better and cheaper if molded. If you have thought of it, you probably have not investigated the method of use or are not equipped to find out the advantages or disadvantages of such inclusion in your product.

Here is the opportunity, and now is the time for you to find out all you want to know from an independent source.

PLASTICS & Molded Products maintains a complete research and investigating department which is at your service. There will be no charge for furnishing you as much information as possible in reply to the coupon below.

PLASTICS & Molded Products
471 Fourth Avenue, New York City

We may be interested in using a molded part for the following article: .....

Its purpose and use is .....

Further information .....

.....

Firm .....

Name ..... Position .....

Address .....

City .....

This coupon is purely suggestive as full information and data are necessary in answering your problem.

SHELLAC MOLDED PARTS

HIGH TEST INSULATION

We are equipped to do

HIGH GRADE WORK AT LOW PRICES

OUR SPECIALTY

Insulated Tool Handles
Weatherproof Sockets

General Moulded Composition Co.
212 Market St., Lynn, Mass.

case however, the insert is pressed tightly about the bar 25 and securely fastens it within the channel member, making a rigid and strong connection between the cross bar of the handle and the spindle.

It will be apparent from the foregoing description that this method of applying the insert to the handle is much simpler than the old method of vulcanizing it in the channel, may be performed much more rapidly and with less apparatus and therefore, may be made at much less cost.

Fountain Parts

(*Continued from page 294*)

ice cream sections constitute a valuable feature for the reasons already given, while other points of superiority over metal covers are, firstly, the absence of "sweating," and, secondly, the absence of clanging noise when in use. The syrup pumps are also set in molded phenol resin, and their mahogany luster in contrast with the white marblework and metal of the structure, produces an effect both pleasing and distinctive. Breaker-strips molded from rubber are used in Frigidaire ice-cream cabinets.

That there is certainly something in the "silent salesman" idea, appears to be proved by the manager's statement that with the introduction of molded parts, that there has been a decided increase in sales.

Similar molded parts of phenol resin are being used by the Liquid Carbonic Company, of Chicago and New York, a concern utilizing molded rings for supporting the porcelain inserts and also molded soda drop nozzles.

For the syrup pump itself, molded phenol resin parts are eminently suitable for the reasons already given, other molded fittings being the gas regulators on the soda draft head, made by the Allen Manufacturing Co., Rockford, Ill. In a related field, syphon tops and spigots for water coolers are being made of molded composition.

BUYERS' GUIDE

ABRASIVES
Nulite Polish Co.
ACCUMULATORS
The Burroughs Co.
The Dunning & Boschert Press Co. Inc.
Hydraulic Press Mfg. Co.
The Adamson Machine Co.
Chas. F. Elmes Engineering Works
French Oil Machinery Co.
R. D. Wood
A. B. Farquhar
ALADDINITE
Aladdinite Co.
ASBESTOS
E. Gross & Co., Hartford, Conn.
BAKELITE
Bakelite Corporation
BLEACHED SHELLAC
Geo. H. Lincks
BLOOD
Jungmann & Co.
BOILERS
Syracuse Steam Generator, Inc.
CAMPHOR (Synthetic)
C. B. Peters Co.
CASEIN
Jungmann & Co.
T. M. Duche
CASEIN PLASTICS
Aladdinite Chemical Products Co.
Karolith Corp.
Erinoid Co. of America
American Machine & Foundry Co.
CELLULOID
Celluloid Co.
CELLULOID SCRAP
Johnson Products Co., Inc.
CELLULOSE ACETATES
Jos. H. Meyer Bros.
American British Chemical Supplies Co.
COLASTA
Colasta Co., Inc.
COTTON FLOCK
Peckham Mfg. Co.
CUSTOM MOULDERS
Allen & Hills, Auburn, N. Y.
Auburn Button Co., Auburn, N. Y.
Braylite Molding Corp., Jersey City, N. J.
Chicago Molded Prod. Co., Chicago, Ill.
Diemoulding Production Co., Canastota, N.Y.
General Molded Comp. Co., Lynn, Maass.
Keystone Specialty Mfg. Co., Cleveland, O.
Kuhn & Jacob, Trenton, N. J.
Mack Molding Co., Little Falls, N. J.
Modern Molded Prod. Co., Providence, R. I.
Northern Indus. Chem. Co., Boston, Mass.
Norton Laboratories, Lockport, N. Y.
Recto Mfg. Co., Cincinnati, Ohio
Schneider Elec. & Mfg. Co., Chicago, Ill.
Scranton Button Co., Scranton, Pa.

DIES
Standard Tool Co.
DUREZ
General Plastics Inc.
ERINOID
Erinoid Co. of America
FIBERLOID
Fiberloid Corp.
FILLERS
France, Campbell & Darling
Geo. H. Lincks
Acme Oil Corp.
C. B. Peters
Wm. H. Scheel
GLASS, SILVERED
Standard Mirror Co.
Tassi Bros.
GUMS
France, Campbell & Darling
Geo. H. Lincks
Wm. H. Scheel
HYDRAULIC EQUIPMENT
Evarts G Loomis Co.
Hydraulic Press Mfg. Co.
Terkelsen Machine Co.
Burroughs Co., The,
Watson-Stillman Co.
Chas. F. Elmes Engineering Works
Southwark Foundry & Mach. Co.
Dunning & Boschert Press Co.
French Oil Mill Machinery Co.
Metalwood Mfg. Co.
A. B. Farquhar
R. D. Wood Corp.
INDA
American Machine & Foundry Co.
KAROLITH
Karolith Corp.
LABELS
Economy Ticket & Label Co.
MANICURE ARTICLES
E. J. Bates & Sons, Chester, Conn.
MEASURING MACHINES
F. J. Stokes Mach. Co.
MIRRORS
Standard Mirror Co.
Tassi Bros.
NON-INFLAMMABLE MATERIAL
Erinoid Co. of America
Karolith Corp.
Aladdinite Co.
E. W. Wiggins
American Machine & Foundry Co.
General Plastics Inc.
Bakelite Corp.
Colasta Co., Inc.

PEARL COATING
Jos. H. Meyer Bros.
Paispearl Co.
E. W. Wiggins
Geo Morrell, Inc.
PHENOL RESIN
Bakelite Corporation
General Plastics Inc.
Colasta Co., Inc.
PUMPS—HYDRAULIC
The Dunning & Boschert Press Co. Inc.
Hydraulic Press Mfg. Co.
Chas. F. Elmes Engineering Works
French Oil Mch. Co.
R. D. Wood Corp.
Metalwood Mfg. Co.
A. B. Farquhar
Terkelsen Machine Co.
PYROXYLIN PLASTICS
Fiberloid Corp.
Nixon Nitration Works
Celluloid Co.
Jos. H. Meyer Bros.
Du Pont Viscoloid Co.
American Celutex Corp.
E. W. Wiggins
The Rubber & Celluloid Prod. Co.
RECLAIMERS
Johnson Products Co., Inc.
ROLLING MACHINERY
Evarts G. Loomis Co.
SCRAP
Johnson Products Co., Inc.
SHELLAC
Geo. H. Lincks
Wm. H. Scheel
Henry W. Peabody Co.
SWING JOINTS
Burroughs Co., The,
Evarts G. Loomis Co.
French Oil Machinery Co.
Hydraulic Press Mfg. Co.
Flexo Supply Co.
TICKETS
Economy Ticket & Label Co.
TOOLS
Standard Tool Co.
TURNERS
Geo Morrell, Inc.
The Rubber & Celluloid Prod. Co.
VISCOLOID
Du Pont Viscoloid Co.
WOOD FLOUR
Becker Moore Co.
John C. Hoornbeek's Sons Co.
C. B. Peters Co.
S. S. Spiro
Burnett Co.
Jungmann & Co.

This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in PLASTICS. Please mention PLASTICS when writing to these firms.

CELUTEX

Rods, Sheets, Tubing **For Prompt Delivery**

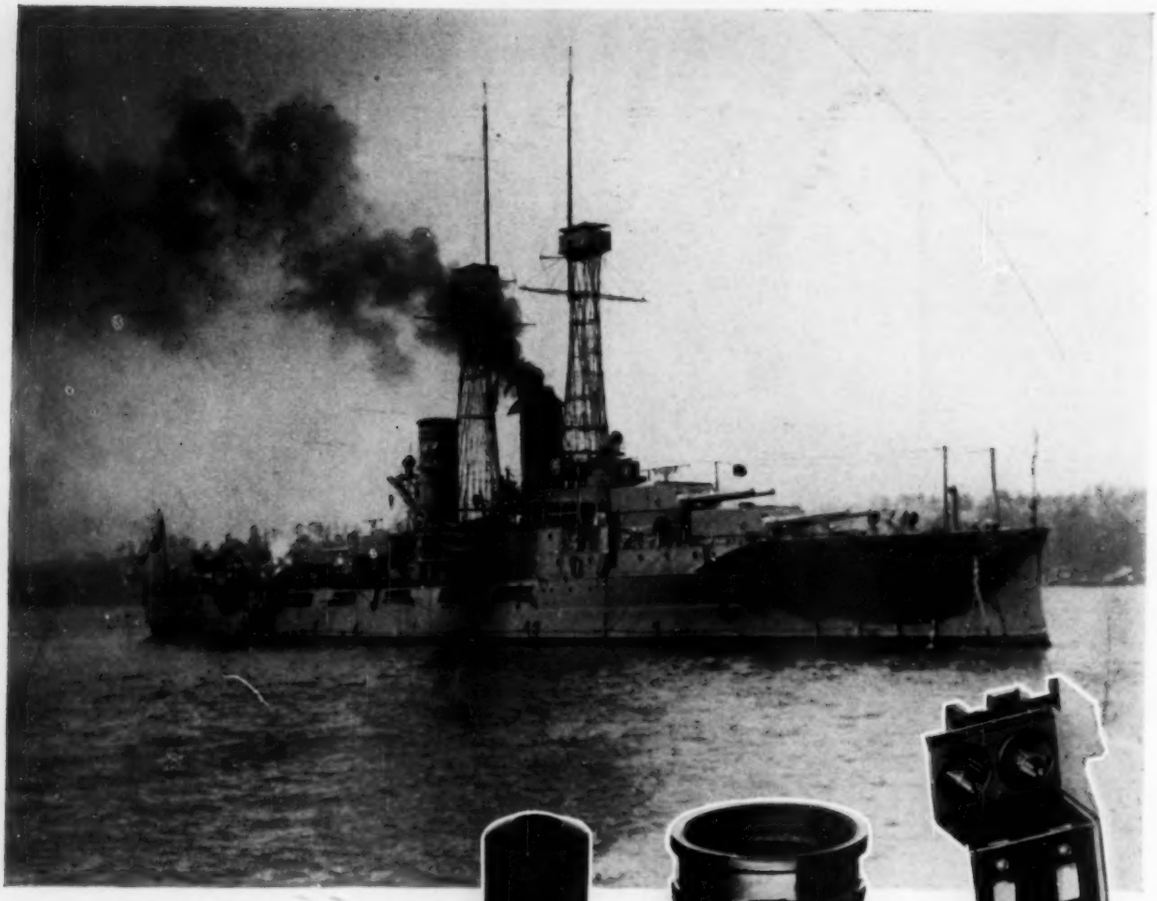
Our line contains a full assortment of both plain and novelty colors and includes a number of new effects which are a decided departure from anything produced heretofore. Our prices are most interesting and our service unexcelled. Samples and quotations on request.

AMERICAN CELUTEX CORPORATION

389 FIFTH AVE. CELLULOID CELUTEX MATERIALS NEW YORK

TEL. CALEDONIA 8877

CELUTEX



Versatility!

THERE is no piece of mechanism that better exemplifies the complication of machinery than a battleship, yet many parts of Colasta are the battleships of molding.

Versatility of construction is something that, with Colasta, has been carried to a fine art and there is nothing in the thermoplastic molding field that cannot be made with this dependable material.

Write for further information.

Colasta

REG. U. S. PAT. OFF.

THE COLASTA CO., Inc.

Hoosick Falls, N. Y.

Protected by U. S. Letters Patent 1251862 and 1251863

NIXONOID

SHEETS

RODS

TUBES

NIXON NITRATION WORKS
NIXON
NEW JERSEY

E. W. Wiggins
New England Representative
Leominster, Mass.

Southern Representative
E. N. Phillips
134 W. Commerce St., High Point, N. C.

W. L. Cratty, Wrigley Bldg., Chicago, Ill.
Western Representative

At Every Turn

AMERITH

"THE MASTER PLASTIC"

Why not let our trained technical staff show you how sheets, rods and tubes of "AMERITH" can be adapted to your needs?

Our SPECIAL ORDER DEPARTMENT can supply you with semi-finished blanks, specially shaped pieces, molded parts, or finished items.

You will be well pleased with the quality and entirely satisfied with the results obtained if you use

"AMERITH—THE MASTER PLASTIC".

THE CELLULOID COMPANY

290 Ferry Street, Newark, N. J.

Sales Offices: 58 West 40th St., New York City

36 South State St.	97 Water St.	340 Sansome St.	188 Morris Ave.	52 Chauncy St.
Chicago	Leominster	San Francisco	Providence	Boston